THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXIII. No. 569.] LONDON, APRIL 7, 1874. [26TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—10,000 cubic feet of gas per ton of coal; 26-candle gas; 13¼ cwt. coke per ton of coal.
The London Exhibition in 1851 was lighted with gas made from Ramsay's Cannel.
RAMSAY'S PATENT CONDENSED COKE.
DO. GARESFIELD COKE.

RAMSAY'S FIRE-CLAY ARTICLES.
GAS-RETORTS, introduced 1828. FIRE-BRICK WORKS, established 1804. FIRE-CLAY SANITARY PIPES, CHIMNEY-TOPS, and all Goods made of Fire-Clay. The Fire-Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article. The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the Works are the most extensive in the Kingdom.
Manufactories—Derwenthaugh, Swalwell, and Hebburn Quay, near Newcastle-on-Tyne; and London Wharves—Falcon Wharf, No. 80, Bankside; and Honduras Wharf, Cubit Town. Large stocks kept.
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GENUINE TORBAY PAINT
AND
ANTI-GALVANIC PAINT.
FOUR PRIZE MEDALS.
WORKS: BRIXHAM, TORBAY.
These Paints are now used in 100 Country Gas-Works, and by all (but one) of the London Gas Companies, on Gasholders, Scrubbers, Purifiers, &c. They will cover tar effectually. Also used by the Admiralty, War Office, Railway Companies, Founders, &c.
They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations.
The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov.* 2, 1866.
STEVENS AND CO.,
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PATENTEE & CONTRACTING GAS ENGINEER
FOR
SETTING RETORTS,
ERECTING AND REMODELLING
GAS-WORKS OF ANY EXTENT,
AT HOME OR ABROAD.
ADDRESS—
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COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,
Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS-RETORTS and OTHER OBJECTS in FIRE-CLAY," and they were also awarded at the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for "GAS-RETORTS, FIRE-BRICKS, &c., for EXCELLENCE of QUALITY."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
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THE OLD TUBE-WORKS, WEDNESBURY
AND
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Established at the commencement of Gas Lighting.
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COMMERCIAL STREET, SPITALFIELDS;
5, CHARLES STREET, SOHO; and
16, SOHO SQUARE,
} LONDON
35, 36, 37, & 39, GRANBY ROW, MANCHESTER.
J. R. and Co. are the original manufacturers of Wrought-Iron Gas Tubes and Fittings, and Inventors of the LAP-WELDED TUBES for Locomotive and Marine Boilers.
J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water; Gun-Metal Cocks, Stocks, and Dies; Galvanized Tubes and High-Pressure Tubes, &c.
Lists may be obtained on application to
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BELL BARN ROAD, BIRMINGHAM,
MANUFACTURERS OF
WET AND DRY GAS-METERS,
OF
FIRST-CLASS MATERIALS & WORKMANSHIP;
Also, STATION-METERS, PRESSURE-GAUGES, STREET-LAMPS, REGULATORS, &c.
ESTABLISHED 1830.

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MANUFACTURERS OF
TELESCOPIC & SINGLE GASHOLDERS,
CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
SUGAR, SALTPETRE, AND ALL KINDS OF PANS.
Roofs, Girders, and Bridges, and General Smith's Work.
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SCOTTISH CANNEL COAL.
J. & W. ROMANS, Consulting Gas Engineers and Coal Factors, of Edinburgh and London, CONTRACT for supplying any quantity of COAL and CANNEL.
They are also Contractors for leasing Gas-Works, for supplying, erecting, or repairing gas apparatus and fire-clay goods.
Messrs. ROMANS, being lessees of several Gas-Works, have their Cannels tested in the ordinary working process, thus securing for their customers a guarantee beyond mere laboratory experiments.
Analysis, prices, and other information will be forwarded on application to their Offices, 8, Forth Street, EDINBURGH; 1, Walbrook, Mansion House, LONDON, or to the "Crown Wharf," Thomas Street, Limehouse, LONDON, where stocks of house, steam, and gas coal are always on hand.
Coal, machinery, fire goods, &c., shipped to all parts of the world.

THE
DUKE OF HAMILTON'S
LESMAHAGOW
CANNEL COAL.
AGENT:
JAMES M'KELVIE,
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GEORGE GLOVER & CO.,

PATENTEES OF THE
NATIONAL STANDARD GASOMETERS
For the English Government, and for the Government of the Netherlands;
MAKERS OF THE DUPLICATE COPY
Presented by Her Majesty's Government to the French Government;
AND MANUFACTURERS OF
IMPROVED
DRY GAS-METERS,
Warranted to Measure correctly, and not to vary.
RANELAGH WORKS, RANELAGH ROAD, PIMLICO, LONDON, S.W.;
236, GEORGE STREET, GLASGOW; AND 15, MARKET STREET, MANCHESTER.

G. G. and Co. have just received the only Medal awarded for Gas-Meters at the Vienna International Exhibition.

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LLOYD AND LLOYD,

ALBION TUBE-WORKS, BIRMINGHAM,

MANUFACTURERS OF

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LAP-WELDED IRON AND HOMOGENEOUS METAL BOILER TUBES.

Boiler-Tube Ferrules, Gun-Metal Gland Cocks, Water-Gauges, Whistles, &c.; Stocks, Taps, and Dies for Screwing, and Gas-Fitters Tools.

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IMPROVED VENTILATING SUN-LIGHTS

WITH TALC REFLECTORS AND SELF-ACTING VALVES

TO PREVENT DOWN-DRAUGHT;

VENTILATING GLOBE LIGHTS for DINING-ROOMS, LIBRARIES, &c.

Ormolu, Bronze, & Crystal Gaseliers;

MEDIÆVAL CHURCH WORK AND CORONÆ

COCKS, VALVES, and FITTINGS for GAS, STEAM, and WATER;

COLUMNS, BRACKETS, & STREET LANTERNS;

BLACK AND GALVANIZED BARREL COMPO AND TIN PIPE.

GAS ENGINEERS,

100, HATTON GARDEN, LONDON.

Drawings and Prices upon application.

VICKARYS AND ROBERTSON,

Late JOHN VICKARY,

ESTABLISHED 1840,

GAS ENGINEERS, CONTRACTORS, IRON AND BRASS FOUNDERS,

WEST OF ENGLAND ENGINEERING WORKS, EXETER.

GASHOLDERS AND TANKS,

Retorts, Retort-Fittings, Condensers, Scrubbers, Purifiers, Station-Meters, Governors, Rack and Screw Valves. Gas and Water Mains always in Stock.

STEAM-ENGINES, EXHAUSTERS, SHAFTING AND GEARING, &c.

GAS-FITTINGS,

Including Chandeliers, Pendants, Hall Lamps, Brackets, Star and Sun Lights of all designs.

WET & DRY GAS-METERS,

Combining most recent improvements in principle and manufacture; upwards of 200,000 already in work, giving highest satisfaction. (A guarantee of five years given with every Meter.)

PLUMBERS WORK, including Lift and Force Pumps; Cocks for Gas and Water and Steam; Brass Fittings.

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TRADE MARK.

THE MEDAL FOR 1862.

The only Prize Medal awarded for TUBES & FITTINGS.

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WAREHOUSE: SOUTHWARK STREET, LONDON.

JAMES RUSSELL & SONS, LIMITED,

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ONLY MAKERS OF HOMOGENEOUS METAL TUBES.

MANUFACTURERS OF

TUBES and FITTINGS for GAS, STEAM, and WATER;

LAP-WELDED, LOCOMOTIVE, MARINE, and other BOILER TUBES;

HYDRAULIC TUBES, BEDSTEAD TUBES, WELL TUBES, TELEGRAPH POSTS, COILS, &c.;

GAS-FITTERS TOOLS, VALVES, COCKS, &c.

THOMAS PIGGOTT & CO.,

(Established 1822,)

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MANUFACTURERS OF

TELESCOPIC & SINGLE GASHOLDERS,

CAST & WROUGHT IRON TANKS FOR DITTO;

PURIFIERS, CONDENSERS, SCRUBBERS, RETORTS, VALVES;

IMPROVED WROUGHT-IRON RETORT-LIDS, CROSS-BARS, & SCREWS;

AND GAS APPARATUS OF EVERY DESCRIPTION.

SOLE MANUFACTURERS OF LIVESEY'S PATENT GASHOLDER MAN-LID,

By use of which Man-lid, inlet and outlet pipes can be examined and cleansed without loss of gas in crown of holder, or ingress of atmospheric air.

ROOFS, GIRDERS, BRIDGES, AND BOILERS OF ALL KINDS.

Drawings, Specifications, and Estimates supplied on application.

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HENRY HOWARD & CO.,

COOMBS WOOD PATENT TUBE-WORKS.

OLD HILL, near DUDLEY,

MANUFACTURERS OF

HOWARD'S PATENT IMPROVED WROUGHT-IRON TUBES,

FOR GAS, STEAM, AND WATER;

Also ORDINARY WELDED WROUGHT-IRON TUBES and FITTINGS,

FOR GAS, STEAM, & WATER, EITHER BLACK, GALVANIZED, OR ENAMELLED.

CORE BARS FOR IRONFOUNDERS, STOCKS, TAPS, AND DIES, IRON COCKS, &c.

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LIME SUPERSEDED

IN THE

PURIFICATION OF ILLUMINATING GAS,

BY

Spence's Patent Dry Copperas,

The only Purifying Material which removes, by one process, all Ammonia and Sulphuretted Hydrogen. It has been in use for upwards of four years at some of the largest Gas-Works in the Kingdom.

TESTIMONIALS SENT ON APPLICATION.

SPENCE BROTHERS CHEMICAL COMPANY, LIMITED,

VICTORIA CHEMICAL WORKS, ASHTON NEW ROAD, BRADFORD, MANCHESTER,

Manufacturers of SPENCE'S PATENT DRY COPPERAS; GREEN COPPERAS;

SPENCE'S PATENT GAS DEODORIZER;

SULPHATE OF AMMONIA, GREY AND BROWN; SULPHURIC ACID; MUDIE'S DISINFECTANT, &c.

CONTRACTORS FOR THE PURCHASE OF SPENT OXIDE.

ALL COMMUNICATIONS TO BE ADDRESSED TO THE WORKS.

Established

1795.

JOSEPH CLIFF & SON,

THE ORIGINAL

WORTLEY FIRE-BRICK WORKS,

NEAR LEEDS,

MANUFACTURERS OF ALL DESCRIPTIONS OF

FIRE GOODS, and Salt-Glazed Drain-Pipes.

LONDON WHARF:

Wharf No. 4, inside Great Northern Goods Station, King's Cross, N.;

LIVERPOOL—1, Back Leeds Street,

Where is always kept a Stock of Retorts, Fire-Bricks, Terra Cotta Ware, and Drain-Pipes.

THE IMPERIAL METER COMPANY, LIMITED,

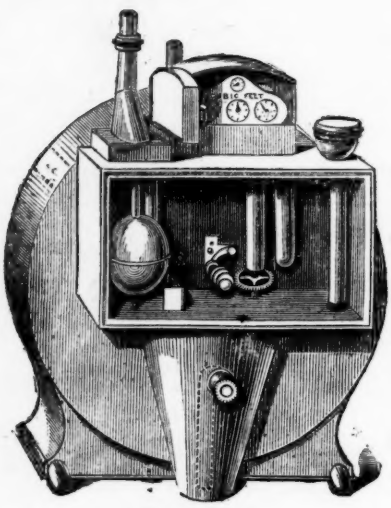
MANUFACTURERS OF

WET AND DRY GAS-METERS,

PRESSURE-GAUGES AND GOVERNORS, AND STREET-LAMP REGULATORS.

FACTORIES:

KING'S ROAD, LONDON, N.W., and GRAY'S INN ROAD, LONDON, W.C.



Front View.

THE

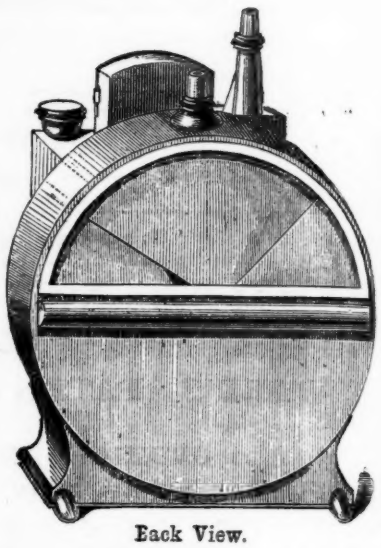
IMPERIAL

COMPENSATING

WET GAS-METER.

DE CASTRO & BURTON'S

PATENT.



Back View.

I. **This Meter is more simple in construction than the common non-compensating Meter.**
II. **An unvarying water-line is maintained.**
III. **No amount or kind of pressure will cause it to "flood."**
IV. **It is practically unaffected by "tilting."**
V. **The friction is less than in any other Meter; and**
VI. **It will last for twelve months without requiring to be refilled.**

THE IMPERIAL METER COMPANY, LIMITED, ALSO MANUFACTURE COMMON NON-COMPENSATING WET GAS-METERS OF ALL SIZES, BOTH IN TIN AND CAST-IRON CASES.

SPECIAL ATTENTION

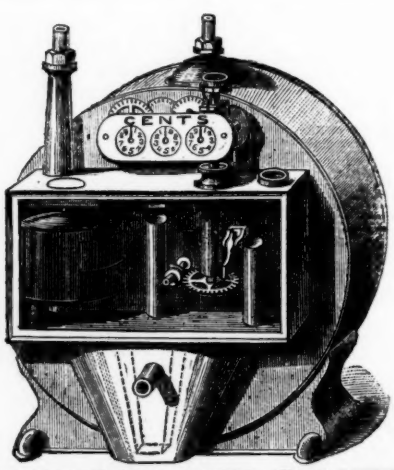
IS PAID TO THE

MANUFACTURE OF

STREET-LAMPS

AND

REGULATORS.



THE IMPERIAL WET GAS-METER.
Non-Compensator.

STATION-METERS

WITH PLANED JOINTS,

AND

GOVERNORS,

MADE TO ORDER.

Mr. GEORGE MACKANESS will represent this Company in the Provinces.

OFFICES: 41, FLEET STREET, LONDON, E.C.

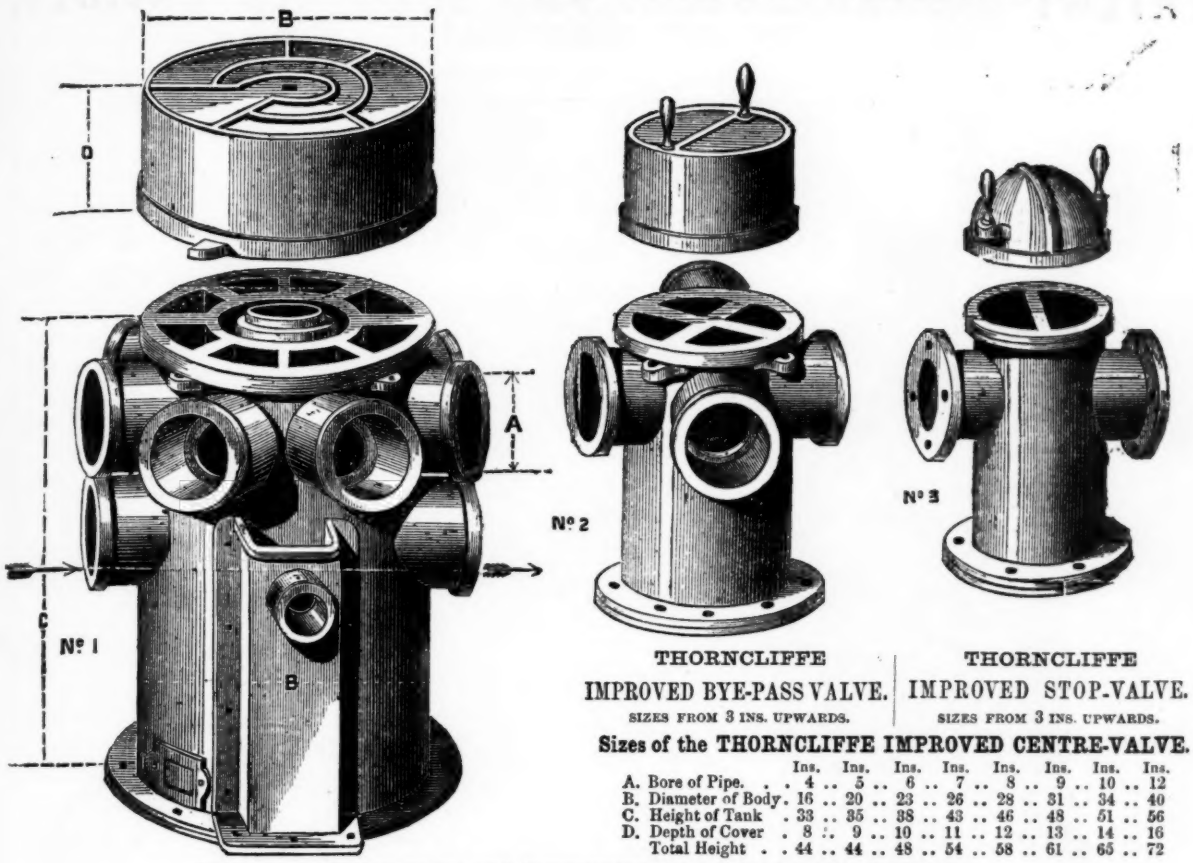
W. MOORE, Secretary.

☞ *All Communications to be addressed to the Secretary.*

MESSRS. NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS, NEAR SHEFFIELD.

IMPROVED CENTRE-VALVES.



THORNCLIFFE IMPROVED BYE-PASS VALVE. SIZES FROM 3 INS. UPWARDS.

THORNCLIFFE IMPROVED STOP-VALVE. SIZES FROM 3 INS. UPWARDS.

Sizes of the THORNCLIFFE IMPROVED CENTRE-VALVE.

	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
A. Bore of Pipe. . .	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 ..	12
B. Diameter of Body.	16 ..	20 ..	23 ..	26 ..	28 ..	31 ..	34 ..	40
C. Height of Tank .	33 ..	35 ..	38 ..	43 ..	46 ..	48 ..	51 ..	56
D. Depth of Cover .	8 ..	9 ..	10 ..	11 ..	12 ..	13 ..	14 ..	16
Total Height . .	44 ..	44 ..	48 ..	54 ..	58 ..	61 ..	65 ..	72

In all cases the Covers are cast heavy enough to resist any required pressure.

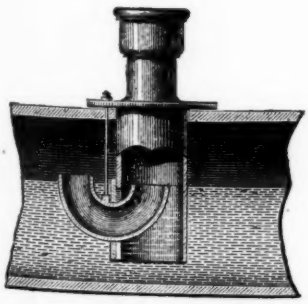
The advantages derived from the adoption of these Valves are so manifest and cardinal that in the immediate character of the change—the simplicity of the machine—the facility affording for cleaning out connexions between Valve and Purifier—the perfect collection and delivery by suitable overflow of the ammonia, at a greatly diminished depth from ground-line over the old form of Valve—the advantage of connecting on the same level, and at any angle, or opposite to each other, the inlet and outlet pipes without dip or rise—the clear acquisition of space in the purifying-house, by being able to place the boxes nearer together, the new Valve being entirely under the floor—and lastly, though of the greatest importance, the passage of crude and unpurified gas during the change is minimized to the merest fraction, thus preventing the fouling by impure gas the delicate machinery and easily affected exposed movements of the station-meter, thereby preventing the introduction of the enemy (unpurified gas) into the gasholder. Also a dead abutment is offered to all back pressure, imparting thereby to the gauges, governors, and hydraulic seals, a steadiness of action never realized with the once famous, but now fast becoming obsolete, Hydraulic Centre-Valve.

N., C., and Co. also Manufacture and Erect

PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.



Messrs. N. C. & Co. are also the Sole Agents for

HAWKINS' PATENT SELF-ACTING DIP-PIPES.

These Patent Self-Acting Dip-Pipes are rapidly coming into general use by gas companies. By their use the whole of the pressure caused by the old kind of Dip-Pipes is entirely removed, therefore the yield of gas per ton of coal is considerably increased. They also act as a perfect safeguard against the deposit of carbon (or scurf) inside the retorts.

A saving of fuel is effected, and the wear and tear to the retorts greatly diminished.

They are also perfectly Self-Acting, they being regulated solely by the gas. They cannot get out of repair, and when once fixed, will last as long as the old kind, and can be easily adjusted should the hydraulic main sink; they can also be worked with advantage where there is no exhauster.

Testimonials can be had from Herbert Unwin, Esq., engineer of the Sheffield United Gaslight Company and the Penistone Gas Company. At both these companies works they have been in constant operation for several months. Further testimonials can be had on application to the Patentee, J. G. Hawkins, Effingham Street Gas-Works, Sheffield.

For Prices, &c., apply to

Messrs. NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS, near SHEFFIELD.

GEORGE WALLER & CO.,

GAS ENGINEERS AND CONTRACTORS,

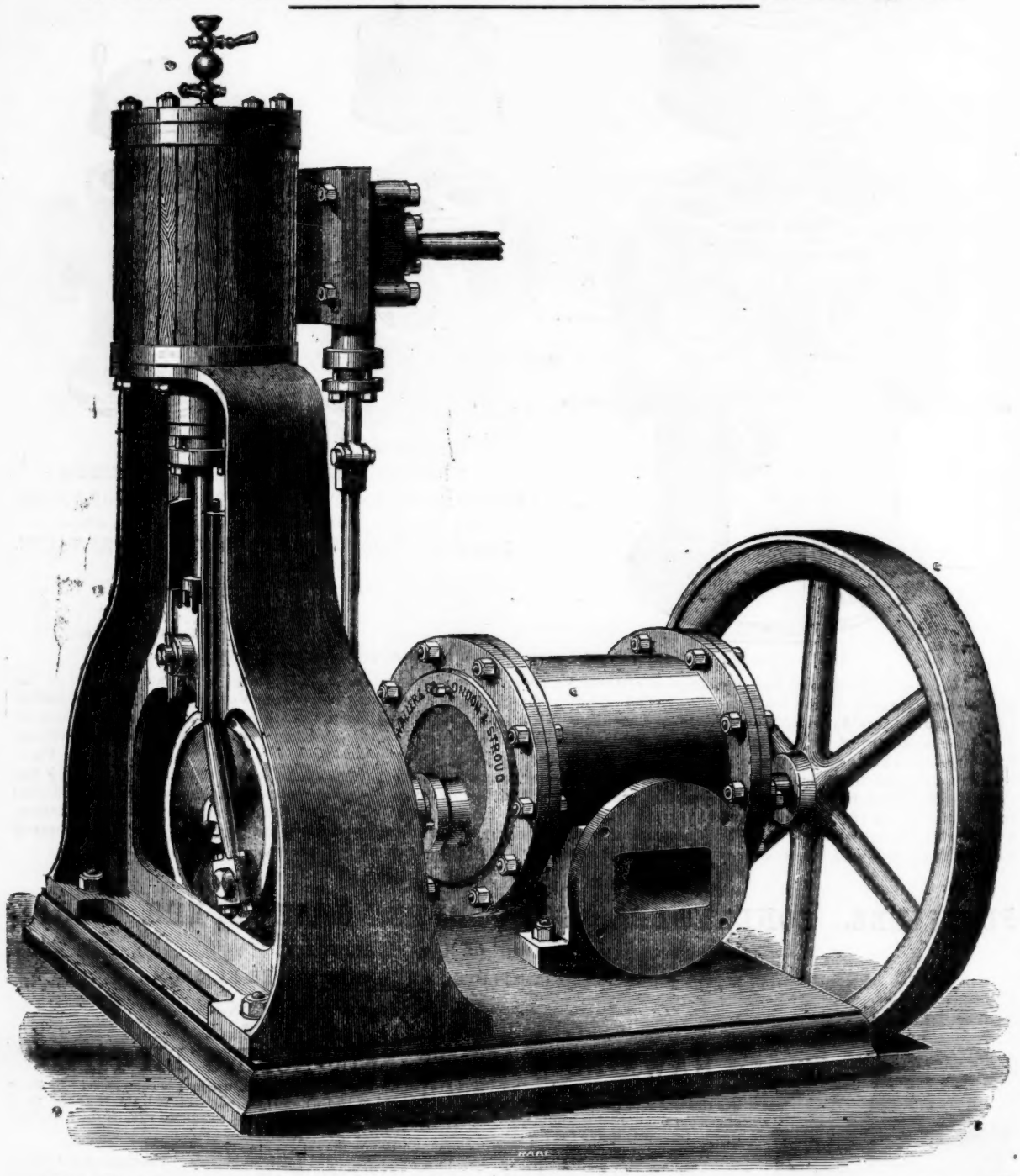
SOLE MAKERS OF

Beale's Improved

PATENT GAS-EXHAUSTERS AND COMBINED ENGINES,

ON ONE BASE PLATE.

NOTE.—The Exhausters are extra large for moderate speed.



This COMBINED VERTICAL ENGINE and EXHAUSTER was specially designed by G. WALLER AND Co. for small works, where space is an object, and is applicable for Exhausters from 1000 to 15,000 per hour. This is the *only* Engine and Exhauster **complete on one Base Plate,** requiring only one foundation.

NOTE.—They are sent away complete, and are easily fixed.

PHŒNIX ENGINEERING WORKS, HOLLAND STREET, SOUTHWARK, S.E.,

AND AT

STROUD, GLOUCESTERSHIRE.

TANGYE BROTHERS AND HOLMAN,

LAURENCE POUNTNEY LANE, LONDON, E.C.,

SOLE MAKERS OF

MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH

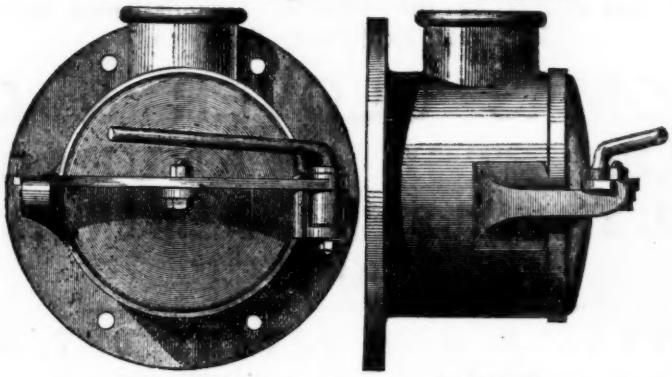
HOLMAN'S PATENT ECCENTRIC FASTENINGS.

OVER 10,000 IN USE.

NO LUTING.

LIDS HINGED TO MOUTHPIECES; NO LIFTING ON OR OFF.

NO SCREWS FOR FASTENING.



FRONT VIEW. SIDE VIEW.

SIMPLE.

ECONOMICAL

DURABLE

EFFECTIVE.

NO DUPLICATE LIDS REQUIRED.

These Lids are proved by many eminent Gas Engineers to be the most efficient, saving much time, labour, and expense; are opened and closed as quickly and with as little trouble as an ordinary furnace door, and by their use the Retorts are soundly sealed during the whole period of carbonization.

These Lids are Adopted by the following (among many other) Gas Companies:—

The Gaslight Company, Beckton (where over 2000 are in use).
" Gaslight Company, Bow Common.
" London Gaslight Company.
" Independent Gaslight Company.
" Phœnix Gaslight Company.
" South Metropolitan Gaslight Co.
The West Ham Gas Company.
" Imperial Gaslight Company.
" Gas-Works, Arsenal, Woolwich.
" Commercial Gas Company.
" Alliance and Dublin Gas-Works.
" Edinburgh Gas-Works.
" Manchester Corporatn. Gas-Works.
The Salford Corporation Gas-Works.
" Rochdale Corporation Gas-Works.
" Liverpool United Gas-Works.
" Birkenhead Gas-Works.
" Birmingham Gas-Works.
" Nottingham Gas-Works.
" Newcastle-on-Tyne Gas-Works.
The Carmarthen Gas-Works.
" Merthyr Tydfil Gas-Works.
" Ystrad Gas-Works.
" St. Alban's Gas-Works.
" Over Darwen Gas-Works.
" Aylesbury Gas-Works.
" Cardiff Gas-Works.

The Morton's Lid is made circular in form, that being the most convenient and suitable shape. It can be used for Retorts of any section, by adapting the Mouthpiece casting from the D, oval, or other shape, at the back, to circular in front.

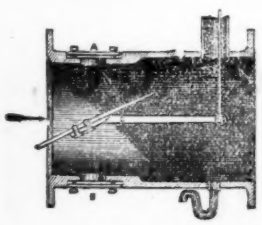
The following important Testimonial, among others, has been given:—

"*The Gaslight and Coke Company. Engineer's Office, 6, Westminster Chambers, Nov.* 14, 1871.

"Dear Sir,—In reply to your inquiry, I have the pleasure of stating that the whole of the Mouthpieces at Beckton have Morton's Lids attached to them and they have given us every satisfaction. We have 2160 in use.—I remain, yours truly, (Signed) "F. J. EVANS."

SOLE MAKERS OF

HUNT'S PATENT EQUILIBRIUM GAS GOVERNOR.



In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown at C on the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

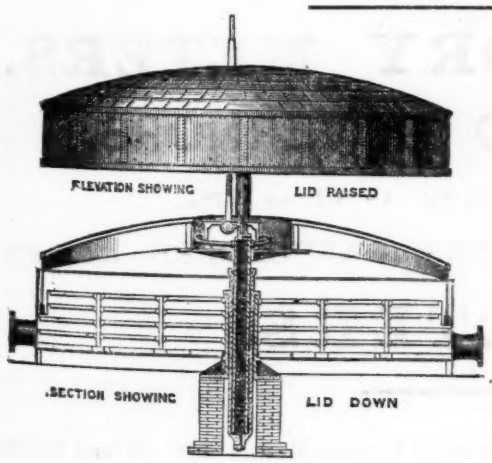
The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide Valve direct in the main; and the holder can be placed at any convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.

These Governors have been adopted by several leading Gas Companies, among whom are the following:—

The Gaslight Company—a 24 in. at Whitechapel District Station.
" " a 36 in. at Goswell Road Station.
" " a 24 in. at " "
" " a 24 in. at the Gas-Works, Beckton.
The Gaslight Company—a 6 in. at the Gas-Works, Beckton.
The London Gas Company—an 18 in. at the Gas-Works, Nine Elms.
" " an 8 in. at " "
" " a 24 in. at " "

Also at the Gas-Works, Rochdale, Monmouth, Devonport, Cannes, and Mentone (France), &c.



PATENT SELF-CONTAINED

DIRECT HYDRAULIC LIFT

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REQUIRES NO TRAVELLERS, CRANES, CHAINS, OR OTHER GEAR.

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THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, APRIL 7, 1874.

Circular to Gas Companies.

The commissioners appointed to revise the price of gas for the Chartered Company have made their award, and granted an advance of 1s. 3d. per 1000 above the statutory maximum for both common and cannel gas. This is in each case 8d. per 1000 above the prices granted last year. It will be remembered that the company applied for an advance of 1s. 4½d. (beyond the statutory maximum) for common gas, and 1s. 8d. for cannel gas. When the memorandum of the commissioners is published, we may, perhaps, see their reasons for making the advance equal for the two qualities of gas, but the fact is of little practical importance to the company. After June 30 next very little cannel gas will be supplied, and we hope the 1s. 3d. will be found sufficient to yield the company their legitimate profits. It is sad to think of, but we believe with the chairman of the company, that these expensive proceedings will have to be repeated every year; at all events, until some further legislation takes place. We are strongly of opinion that, whatever fall may happen in the cost of coal, it will never return to such a price as will allow the Chartered to sell 16-candle gas for 3s. 9d., and pay their statutory dividends. Nevertheless, it may be reasonably expected that the prices now granted will not be required beyond the present year.

The half-yearly report of the Phœnix Company has been issued, and from it we learn that the profit of last half year's working is £5717 less than the sum required to pay full dividends. So much, then, must be made up from the "unappropriated balance" of the company, which will now stand at £32,821. It has, of course, been necessary for the directors to purchase coals at greatly enhanced rates, but we hope that the advanced price of gas in the current half year will considerably more than cover the increased cost.

While the coal market is exhibiting a decidedly downward tendency, a struggle between the colliers and coal proprietors is impending, or rather has commenced, which may have a considerable effect on future rates. While endeavouring to keep the price of coal as high as possible, the proprietors, in view of a falling market, are anxious to diminish the cost of raising it, and propose a reduction of 20 per cent. on the miners wages. This is at present stoutly resisted by the men; and if colliers were a provident race, and had accumulated savings during the recent high rate of wages, they might have been successful; as it is, they will probably be starved into submission in the course of a few weeks. If, however, the struggle be continued for a month or two, it will leave its mark on the coal contracts for the next twelve months.

The summer instructions of the Metropolitan Gas Referees have been published. The only change made is in the maximum of sulphur allowed for the Imperial and South Metropolitan Companies, and for the works of the Chartered Company, other than those at Bow and Beckton. For these latter, the maximum is still 20 grains per 100 feet; but for the former, the maximum allowed is now reduced from 30 grains to 25 grains. Until the returns of the chief examiner for the past quarter are published, we are not in a position to judge how far the companies are in a position to comply with this order. We should be sorry to see another "supplementary order" again raising the maximum to 30 grains, but we fear that at some of the works implicated it will be found difficult to bring down the sulphur to the required maximum.

As we anticipated, the Standing Orders Committee of the House of Commons have reported to the House that no sufficient reasons have been shown for suspending the orders in the case of the Metropolis Gas Bill. The promoters, of course, never expected any other decision.

A public meeting of the ratepayers of Birmingham is called for the 13th inst., to authorize the Town Council to make or concur in an application to Parliament, in this or the ensuing session, for the confirmation of the agreements entered into for the purchase of the gas companies. When the meeting is held, we hope some gas-consuming ratepayer will be found bold enough to tell the Corporation that they have no right to become a trading concern. They may, if they so will, and if the ratepayers do not object, undertake the supply of gas and water; but it should be impressed upon the Town Council that if they make a profit upon gas they simply impose an additional tax on gas consumers. In the case of water, the consumption is of course universal, and no Corporation expects to make a profit on the distribution of that commodity; but gas consumers constitute but a portion of the ratepayers, and the profits of gas, when applied in aid of rates, go to the relief of people who ought to bear their share in the general taxation. The true policy of a Corporation would be to reduce the price of gas to the lowest possible limit, and so promote a more general consumption. That would be a true and honest form of co-operation, which would commend itself to the whole community. If any Birmingham ratepayer deludes himself with the idea that a reduction of rates will ensue when the Corporation gets possession of the gas undertakings, he will certainly find himself mistaken. After the best study we have been able to give to the accounts of several local authorities having gas-works, and others without them, we are forced to the conclusion that gas profits make no impression on the rates. In some cases, indeed, it would appear that boroughs having gas-works are more heavily rated than some without, but there may be special reasons for this not within our knowledge. We cannot, then, too strongly counsel the ratepayers of Birmingham to insist on the application of the profits of the gas undertaking to the reduction of the price of gas.

At a citizens meeting in Dublin, very influentially attended, it has been determined to offer the most strenuous opposition to the Confiscation Bill of the Corporation, and to petition against the Bill of the company, with a view to obtain some amendments. An objection is made to any further increase in the capital of the company. The present capital is, unfortunately, high, but some further expenditure is absolutely necessary to make it productive. It is not exactly fair to compare the amount of capital per 1000 feet of gas sold of the Alliance Company with the London companies. We are here much larger consumers of gas, but when the Alliance Company are able to reduce the price, and so stimulate consumption, the disproportion in the capital now remarked upon will, to a great extent, disappear. In the meantime, in order to raise the yield of gas to its proper proportion, and to reduce leakage to a reasonable amount, the expenditure of additional capital is absolutely necessary. We have strong hopes that a committee of citizens will arrange terms, so that the Bill of the company may be unopposed; except by the Corporation, who would do well to withdraw their Bill, and make terms also. It seems to us, from all we read, that a clause in the company's Bill, guaranteeing reductions of price at stipulated periods, such as was contained in the last Bill, would satisfy the opponents. But, then, who is to guarantee the future of the coal market?

The meeting of the company offers little for notice. The clear statement of Mr. Drimmie shows the influence that the advances in the price of coal and labour have had in bringing affairs to their present condition; but this is only a part of the question. Until the enormous amount of leakage is largely reduced, the directors will be open to the imputation of neglecting the interests of the shareholders.

It would seem, from the report of a meeting of the Tunbridge Wells Improvement Commissioners, which we publish in another place, that the gas company are being forced into a severe contest with the commissioners. These latter are endeavouring to compel the company to sell their undertaking, and have resolved to place every possible obstacle in the way of the company obtaining an Act they are promoting. One object of the Bill is to obtain a site for new works. The commissioners object to the proposed spot, and suggest another; but it turns out that this alternative site is land belonging to the commissioners, which they positively refuse to sell to the company. The opposition of the commissioners is most unreasonable, and unless the Bill goes before a very strange parliamentary committee, it is not likely to be listened to. The amount of additional capital asked for may appear large, but gas companies ought not to be forced to Parliament every few years to obtain power to increase their capital. Few towns have been better served by a gas company than Tunbridge Wells, and it is simply the natural success of a well-conducted undertaking that has excited the cupidity of the commissioners.

"A New Artificial Light" is announced, and this time not—or, perhaps, we ought to say not yet—by a limited company, with a proposed capital of £100,000, of which £50,000 is to go to the financial agent. The Rev. Henry Moule, of earth-closet fame, discovered, many years ago, that gas may be produced from Kimmeridge shale, and after 20 years of experiment, "in "such spare moments as he could snatch from the active duties of "a large parish," he is found in a cellar—or, as the representative of *The Times* puts it, "in a small apartment, more or less subterranean in its character"—under a blacksmith's shop, in a by-street in Dorchester, making gas with some evidently crude apparatus, and collecting it in a holder formed of an iron bucket inverted in a tub of water. It was, at one time, the intention of the reverend gentleman "to *give* his invention to the world;" but some eminent scientific friends have dissuaded him from such an act of reckless generosity. All, therefore, except the light in the blacksmith's shop, and the inverted iron bucket, is kept dark; and the limited company may yet appear. It is a habit of some men to disregard all that had been done in a matter before they took it in hand; and the consequence is that we meet every day with inventors who have produced things new to themselves, but novel to nobody else. If the Rev. Henry Moule had been at the trouble to inquire, he would have found that Kimmeridge shale has been taken in hand by people thoroughly competent in the manufacture of gas and in the distillation of oils, and it has never been found to pay. A little stinking oil, which can, however, be easily purified, may be distilled from it; but the quantity is too small to pay the cost of distillation, let alone purification. So, too, a small amount of gas may be produced from the shale, but not enough to cover the cost of the fuel used to obtain it. No better result is to be expected in the hands of an innocent gentleman like Mr. Moule, and it is a great pity to see him wasting, in the blacksmith's cellar, time which surely might be better spent in ministering to the wants of a large parish.

A new edition of Newbigging's "Handbook for Gas Engineers "and Managers" has just been issued. Valuable additions have been made, some small errors in the first edition have been corrected, and the contents are arranged on a better plan. The book is now published in a small octavo form, which makes it a handy book, either for the pocket or desk.

WATER AND SANITARY NOTES.

The continued drought in Scotland is beginning to tell on the water storeage of the towns. At Dundee it has been considered advisable to shut off the night supply, and to urge the inhabitants to economize as much as possible the use of water. The rainfall up to March 18 has been only 5·5 inches, and the reservoirs at that date were 120,643,185 gallons under their full storeage capacity. There was, however, a sufficient supply for 156 days, at the rate of 3½ millions per day.

In the Liverpool reservoirs the water is also falling, and the stock is 285 million gallons less than it was at this time last year. While some of the inhabitants are urging a further resort to the wells, the borough analyst continues to report these as much contaminated with nitrogenous organic matter and "oxidized "nitrogen," under which latter sounding name an infinitesimal portion of innocent nitric acid is made to look dangerous.

In London we are again scared by the report of "living and "moving organisms" in the waters supplied by some of the metropolitan companies, which, it is said, render such waters "unfit for dietetic purposes." The Thames and some of its tributaries have recently been flooded, and, some of the companies not having sufficient subsiding tanks, the filter-beds have been overtaxed—got choked, in fact—and some unfiltered water was necessarily allowed to pass, to keep up the supply. A little of this leaves its mark for some time, and hence the report that the water for the past month was "slightly turbid." No harm could possibly result from this, but it serves the purpose of sensational analysts to keep up a constant alarm on the subject. For our own parts, we prefer water rendered "slightly turbid" by clay or marl, the amount of which in a gallon is scarcely appreciable in the balance, to the far more dirty, brown, peaty water which some would persuade us is the more wholesome. The water is "unfit for dietetic purposes," but no one will assert that a single Good Templar has suffered from the free imbibition of it. As regards the "living and moving organisms," which require a powerful microscope for their discovery, we know that such organisms swarm in the air we breathe; but there is nothing to be gained by denouncing the air as unfit for breathing purposes. There is no company to be abused or fined, no possibility of persuading everybody to wear cotton wool or charcoal respirators at home and abroad, and no profit to be got by exposing an evil which cannot be remedied. We desire as much as any one to be supplied with clean water, but at the same time strongly protest against the assertion that water the slight turbidity of which is only discoverable by the use of a two-foot tube, and which contains a few living and moving organisms only to be seen by the aid of a powerful microscope, is unfit for dietetic purposes and dangerous to health.

The discussion as to the desirability of returning to a constant supply of water in Liverpool still goes on, and is advocated by the water engineer, Mr. Deacon, in a report for which, unfortunately, we have no space. While perfectly agreeing with Mr. Deacon as to the benefits of a constant supply, we are still of opinion that he exaggerates the possible evils which may result from the intermittent system. He might have remembered that some cities supplied on the constant service system are much more unhealthy than others supplied on the intermittent system. He seems to suppose that the air which gets into a pipe must necessarily come from a water-closet or other polluted source, and that this air is dissolved by the water when turned on under pressure. Now, the probability is that the bulk of the air finds its way through the ball-cocks of the cisterns, and is no more polluted than the general atmosphere. Further than this, when the water is turned on, every ball-cock is open, giving free vent to the air as it is driven before the water under little or no pressure. If, indeed, such evils as Mr. Deacon suggests existed with an intermittent supply, London must have been depopulated before now. But London is the healthiest of large cities, notwithstanding the intermittent supply and the previous sewage contamination in the water.

A majority of the Town Council of Wakefield have resolved to petition Parliament in favour of the Bill of the old water company, and oppose that of the new company, and we may therefore imagine that the same majority are opposed to the purchase of the water-works. Both old and new company agreed to give a constant supply. The proceedings at the meeting were of a very lively character, and the reporter states that very strong language was used in the course of the discussion.

There are people who are thankful for small mercies. The shareholders of the Chiltern Hills Spring Water Company, after ten years of patient waiting, are now rejoicing over a first dividend of 2 per cent. They should moderate their transports. If they go on like this, they will soon excite the envy of the Aylesbury Local Board. One thing they had to lament, and that was the loss of one of their largest customers—the Milk Company! Has the Adulteration Act anything to do with this? or have the Milk Company dug a well to get a supply of "Simpson" unobserved?

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

VIII.

Historical Introduction.

(Continued.)

The Imperial Gas Company obtained their first statutory powers in 1824, their capital at that time being fixed at £250,000. Sir William Congreve about this period visited various parts of the Continent with the view of disseminating a knowledge of the advantages of gas lighting, and by his exertions the Imperial Continental Gas Association was established. In Berlin, Amsterdam, Hanover, Rotterdam, Brussels, and Ghent, gas-works were shortly afterwards erected by this association, some of the towns being lighted with oil gas, and others with gas produced from coal. At Berlin the association met with serious opposition from Blochmann, who afterwards displayed considerable ability and intelligence in the construction of gas-works, and by him a large number of continental towns and cities were lighted with gas.

At the first establishment of gas lighting, the only available wrought-iron pipes were old gun-barrels, but as the supply of these materials was not equal to the demand, the manufacture of hand-made wrought-iron pipes was commenced, the process being necessarily very costly. In 1825 Cornelius Whitehouse obtained a patent for

"Improvements in manufacturing tubes for gas and other purposes," which improvements consisted in the production of these pipes by machinery. For this purpose the iron was cut to the size necessary, and was then rudely bent to the desired form; it was then heated to the welding point, and afterwards drawn through a mandril, so that the pipe was formed and welded at one operation. By this invention wrought-iron pipes were produced at a very moderate price, thus affording great facilities for the general advancement of gas lighting. For many years these pipes were known by the name of "gun-barrel," a name derived from the description of pipe they had superseded. In 1830 Whitehouse's patent was acquired by Mr. James Russell, from which period his name has been associated with the invention.

In 1825 Mr. Thos. Dewey arrived in England from America, to study the question of lighting towns by gas; and with this object in view, he visited many of the establishments in this country for the manufacture of both oil and coal gas. Gas lighting, however, was not extended to the United States for some years afterwards.

The first attempt to render hydrogen gas, obtained by the decomposition of water, available for illuminating purposes, was patented about this period by Ibbetson, but the perusal of his specification leads us to imagine that he did not understand much of the subject. Broadmeadow, also, at this time patented an exhauster, which consisted of a gasholder working in water, his object being to reduce the loss of gas by escapes at the mouthpieces of the retorts, and elsewhere in the manufacturing apparatus.

An addition to the metropolitan companies was made in 1824, by the establishment, under a deed of settlement, of the Independent Company. It was founded by the late Mr. Laing, who had been formerly in the service of the Chartered Company. The Independent commenced lighting in 1826, and for a short time competition existed between them and the Chartered Company; which, however, ended in a districting arrangement. They obtained their Act of Incorporation in 1829, with a capital of £120,000, and the district described and assigned to them in their Act is the one now lighted by the company.

In 1825 Samuel Crosley invented the dry gas-governor, an instrument which, in various forms and shapes, has since that period been the subject of almost innumerable patents. Clay retorts also began to be employed in Scotland, where they subsequently became generally adopted many years before they were used in England.

Gas lighting had made such marked and rapid progress that in 1829 it appears there were about 200 gas-works in various towns and cities of the United Kingdom. In that year the Imperial Company made a second application to Parliament, for power to increase their capital £250,000, and the British Company, referred to by Sir William Congreve as the Whitechapel works, were incorporated with a capital of £200,000. At the commencement of their history the latter company gave promise of considerable prosperity, and great exertions were made by them to obtain the power of lighting the City of London. So assured were they of succeeding in this endeavour, that mains were laid from their works to the City boundary at Aldgate, and year after year they applied for permission from the civic authorities to extend their supply of gas within the limits of the corporation domain, but without avail.

Although, in the commencement of their history, gas companies were by no means commercially successful, the greater part of them never having made profits, while a few paid dividends, which they had never earned, their experience did not deter the formation of rival undertakings in the metropolis, and we find, in 1830, the Equitable Company established, and erecting works near Pimlico, whence their mains were promptly extended through a large portion of the West-end of London, and as far eastward as the western boundaries of the City, enabling them to compete with the Chartered and Imperial Companies in their respective districts.

In the same year Michael Donovan obtained a patent for "An improved method of lighting places with gas." In his specification he says:—"This invention relates to the enriching those gases which afford little light while burning, by substances which will impart to them a higher illuminating power, and may consist in bringing the gas (by preference) produced by the action of steam on coke, &c., heated to redness, into contact with the liquid or vapour of spirit of turpentine, spirit of tar, coal naphtha, naphthaline, or other substances, heated or otherwise, and employing the combined mixture as the illuminating agent." The principles laid down by the inventor in this specification became the subjects of future patents obtained by Mollerat, Lowe, Manby, Val Murino, Cruckshanks, Stephen White, and a host of others—indeed, reference to the Patent Register shows that, even to the present day, from time to time, identically the same system is patented.

In chronological order, it should have been stated that, in 1820, John Malam patented the first dry meter. This apparatus consisted of an outer box or case containing six bellows, similar to those ordinarily employed for domestic purposes, with their nozzles meeting in the centre. The description is not intelligible, and the whole appears the result of a hasty idea never carried out; and it is singular that a practical man like its author should have presented to the world such an unfinished instrument. The idea of the dry meter, however, having been suggested, other inventors applied themselves to its development, the earliest of these being Bogardus, an ingenious American, who invented a meter having one diaphragm, which was patented by Miles Berry in 1833. This patent led to the formation of the "Patent Dry Gas-Meter Company," with a capital of £80,000. With a view to carrying on a large business, the company built what, at that time, were considered very extensive premises, adjoining a canal, where the meters were produced in very large numbers; but the company sadly lacked the commercial element in their enterprise, and but little effort was made to introduce these instruments to the notice of gas companies. As a natural consequence, the business failed, bringing with it the ruin of the solicitor who had organized the company, and had embarked his all in the venture.

Telescopic gasholders, which have been of such vast assistance to gas companies when carrying on their operations in a limited space, were patented by Hutchinson in 1833. It has been erroneously asserted that gasholders of this description were in existence prior to that period—an error no doubt arising from a misconception of an invention of "improvement on gasometers," patented by Holdsworth in 1817. The gasholder described in the specification of that patent was so thoroughly impracticable that it has not merited a description here.

In 1833 the London Gas Company was established, and they commenced and carried out their enterprise with remarkable vigour and perseverance. Their works were erected on leasehold ground at Vauxhall, whence they laid their mains into the districts north and south of the Thames, in competition with the Chartered, Imperial, City, Equitable, Phœnix, and subsequently the South Metropolitan Companies, opposing the City Company only in that portion of their district which extended beyond the municipal boundary. For a long period they were engaged in a ruinous competition with these companies, both for public and private lighting; and, as could only be expected, for many years they carried on their operations without realizing profits.

The lease upon which the company held the ground at Vauxhall, expired in 1865; and the Duchy of Cornwall refusing to renew the term, the company were compelled to seek a fresh site for their works. They were fortunate in securing upwards of 13 acres of freehold land at Nine Elms, on which were erected new works and offices, adequate to the requirements of the greatly-extended business of the company.

In 1833 the French National Gas Company was projected for lighting Boulogne-sur-Mer, but their capital of £10,000 being found insufficient, the business was handed over, in 1835, to a new association, the present European Gas Company, which was formed for this purpose, and also for lighting other towns in Europe, with a capital of £200,000. Mr. George Lowe and several London bankers and capitalists were the promotors of the undertaking, which has continued in English hands to this time. The lighting of Havre was undertaken in 1834; Caen and Amiens in 1835; Nantes followed, and a concession for part of Rouen was obtained in 1846.

All the plant for these gas-works had to be sent from England, and very few of the articles required to carry on the business could be obtained in France, except at prices considerably in excess of those charged by English manufacturers. The late Mr. T. G. Barlow, who constructed various works for lighting continental towns and cities, was one of the principal contractors employed, and the name of his firm may still be seen on several of the cast-iron tanks in use.

Great difficulty was encountered in persuading the inhabitants to use gas in their shops and dwellings, and this could only be overcome by sacrificing a considerable amount in fittings, which, in many cases, had to be given away, or lent at a nominal rent.

This company committed the capital fault of not securing their position by exclusive privileges, and later on, when they became successful, they suffered for this neglect or want of confidence by seeing competing French companies established at Havre and Amiens. The opposition at Havre was bought off in 1860, but Amiens was divided into districts, one of which had to be given up to the French company.

Dublin was also one of the stations of this association, but an influential shareholder having disputed their legal powers to light a city in Ireland, the Alliance Company was formed as an offshoot, specially to undertake this one town.

Exclusive privileges have now been obtained by the European Company in all the remaining towns, and the company is one of the most flourishing and best conducted in the kingdom. They have passed through the revolution of 1848, as well as the great war and political convulsions of 1870 and 1871, without appreciable damage, and appear to have escaped even the ruinous effects of the high prices of coals, which have lately prevailed. It is an instance of one of the most successful English undertakings carried on in a foreign country.

This company having experienced inconvenience from the unacknowledged position of English joint-stock companies in France, were mainly instrumental in obtaining their recognition by treaty between the two countries, and many have been the advantages secured to both by these negotiations, which were principally conducted by Mr. Backler, the general manager and secretary, with M. Rouher, then Minister of Commerce under the French Empire.

The coals used by the company are almost exclusively English, but during the French War, and subsequently, Pas-de-Calais coals have been carbonized in the works in considerable quantities.

The South Metropolitan Gas Company was founded in 1833 as a cannel gas company, for supplying all the parishes of South London, the works being situated in the Old Kent Road, with a water frontage on the Surrey canal. It was incorporated in 1842, with an authorized capital of £200,000, and with power to increase to £250,000, either by borrowing £50,000, or by the issue of shares to that amount. At Michaelmas, 1853, districting arrangements were entered into between the several companies on the Surrey side of the Thames, and these districting arrangements were sanctioned by Parliament in the Metropolis Gas Act, 1860. In 1869, the South Metropolitan Gas Company obtained a fresh Act, which gave them power to raise a further capital of £250,000, with a maximum dividend of 10 per cent., and placed them under somewhat similar regu-

lations to those imposed on the Chartered Company in the previous year. The company first supplied gas in 1834, but was violently opposed by other companies, and, moreover, was unable for years to obtain access to the borough of Southwark. When, at last, permission was granted, through the influence of the present chairman, Mr. Simpson, the rich cannel gas supplied by this company at the same price as the common gas of its neighbours, brought to it a number of consumers as well as the public lighting. It was soon found, however, that to supply cannel gas at the price of gas made from common coal was not commercially successful, and its abandonment became a necessity about the year 1838.

In October, 1836, a great explosion, felt all over London, took place at these works. The purifying-house, a practically sealed building, all openings being glazed and no ventilation provided, became charged with an explosive mixture, and, on the entrance of a man with a light, the place blew up, completely destroying the building, and breaking windows all round to the distance of a mile. Fortunately, however, no life was lost. Since this time it has always been a tradition of the company to adopt the most efficient means of ventilating every place where an escape of gas is possible.

The company paid its first dividend of 1½ per cent. for the year in 1836, 2½ per cent. in 1837, and 4 per cent. in 1839, creeping on to 6 per cent. in 1842, and this rate, with an occasional bonus, was continued for some eight or ten years, when the competition of the Surrey Consumers Company in 1851, 1852, and 1853, brought the dividends in those years down to 5 per cent., to rise again to 6 per cent. (generally with a bonus of from 1 to 3 per cent.) until 1859. Thenceforward the company have paid 10 per cent. without a break to the present time.

During the first five years of the company's existence the management was in exceedingly bad hands; so much so that, in 1838, £88,000 of capital had been expended, while the consumption of coal in that year was under 5000 tons, equal to £19 of capital per ton of coal. About this time, a very able and upright man became chairman, Mr. George Holgate Foster, under whose rule a new system was introduced, and the waste of capital stopped; but it required ten or twelve years of economical working to recover the lost ground, the result being that, in 1850, with £100,000 of paid-up capital, the annual consumption of coal was about 15,000 tons, equal to, say, £7 of capital per ton. From this date the right course would have been for the company to have paid the full dividend of 10 per cent. when earned, and made calls to meet the capital expenditure needed for the extending business, instead of making those extensions out of revenue, and thus depriving the shareholders for the time being of their just rights. By 1865 the whole of the original capital of £200,000 had been exhausted, part having been raised by calls, but a considerable portion by additions to the shares, to make up to the shareholders the difference between the dividends received and the 10 per cent. which would have been paid if a portion of the profits had not been laid out on capital account. The capital in 1868 was £250,000, paid up; it is now £350,000, and the tonnage 77,000. In 1865 the proportion of capital to coals was somewhat over £5 per ton; and, from this point, it has gradually fallen to from £4 10s. to £4 12s., below which it does not seem possible to get.

The price of gas was at first 11s. per 1000; it dropped from 9s. in 1840 to 6s. in 1848, then, through the introduction of the Surrey Company, to 4s., in 1850. After the districting, it was increased to 4s. 6d., and remained at that price until 1860, when it was again reduced to 4s., and from this to 3s. 8d., 3s. 4d., 3s. 2d., and from January, 1872, 3s., without meter-rents, which were given up about 15 years ago.

Since Midsummer, 1839, there has been practically no change in the management. At that time the late Mr. Thos. Livesey, who had been 18 years in the service of the Chartered Company, became chief clerk to this company, and on their obtaining the Act of Incorporation in 1842, he was appointed its first secretary. It may not be inappropriate to mention that Mr. Livesey's uncle, the late Mr. Thomas Livesey, of Hackney, and of Wood Street, Cheapside, was one of the founders of the Chartered Company, and was the deputy-governor of that company at its formation. He also took an active part in promoting gas companies in other parts of the country, and to him was the Mr. Thos. Livesey of the South Metropolitan indebted for his first appointment in the Chartered Company in 1821.

The South Metropolitan Company was raised from its very depressed condition by the patient and persevering exercise of ordinary means. Personal devotion to duty, coupled with great caution and economy on the part of the secretary, told their tale. He worked hard for just 30 years, and died in harness at the age of 65, on the 10th of October, 1871, just before the gloom that has since enveloped gas undertakings became visible.

This company have, however, so far weathered the storm, that the price of gas was reduced 2d. per 1000 after coal had risen 2s. 6d. per ton at the pit; and owing to the possession of a good reserve, the company has not yet had to raise the price, and will now, in all probability, have no necessity to do so. In 1872 the great agitation among the gas stokers took place, but the South Metropolitan escaped a strike. The unaccounted-for gas is brought down to a point which will not easily be surpassed, partly owing to the rule adopted by the late Mr. Livesey of supplying only wet meters, and to the careful examination of the mains. The company lights a wide district, covering some 13 square miles, and extending from the New Kent Road southwards as far as Croydon parish, taking in considerable portions of Newington, St. George-the-Martyr, a small part of Bermondsey, nearly all Camberwell, a large slice of Lambeth, and all Streatham.

Some years back a large tract of freehold ground was purchased adjoining the old works, on which new works are now in course of erection, which, while not pretending to rival the large works lately erected in other parts of London, will be capable of efficiently meeting the demand for gas in the extensive district of this company.

The shares of this company have for some years realized higher prices in the London markets than most others.

We have been induced to extend our notice of the history of this company because of the misunderstanding which has long prevailed as to the causes of its success, and its ability to supply gas at a price below that of any other metropolitan company.

In the year 1834 was presented to public notice the "lime light," patented by Gordon and Deville. This discovery, when first produced, was supposed to be destined speedily to supersede gas lighting, and the publicity of the invention naturally caused some anxiety to those therein interested. According to the specification of the patent, a jet of hydrogen and oxygen gases combined, was ignited and caused to impinge on a small cylinder of lime, to which a slow rotary motion was imparted, for the purpose of presenting a continuously fresh surface to the jet. By this means the lime became incandescent, and produced a light of great intensity. The invention excited the greatest admiration, and was exhibited in several public places of resort, as well as in private establishments; but the expense of producing the gases was a fatal objection to its general use.

By Brunton's patent of 1835 we are first introduced to mechanical stoking, which, although up to the present time cannot be said to have achieved a success, will undoubtedly eventually be adopted, alike to the advantage of the companies and the men in their employ. The object of this invention was to admit the coals by means of a hopper into the retort, the coal as well as the coke being pushed forward by a piston, the rod of which passed through a stuffing-box in the retort-lid, the coke falling into a box sealed with water at the further end. The system was tried in a few instances, but, being found impracticable, was abandoned. A very similar plan was patented by Barnett the following year.

The Commercial Gas Company was formed as a consumers company, in 1836, by a number of tradesmen in the districts of Mile End and Whitechapel, who had become dissatisfied with the existing supply of gas. They began their operations under considerable disadvantages and amidst many difficulties, the chief of these being the determined hostility of most of the local authorities. The Whitechapel Paving Board was more particularly antagonistic, and absolutely refused permission for the company to remove the footways in order to lay their services. This unexpected opposition at one time assumed a most serious aspect, but the company's engineer proved himself equal to the emergency. The mains were laid in the carriage-road, and as he was prohibited from interfering with the pavements, the engineer adopted the novel method of boring from the interior of the consumer's premises under the footways, to the main, where a trench was opened. In many instances the service-pipes were thus carried for a distance of 40 feet—probably the only instance of the kind on record.

This company have from the commencement been a success. Possessing no advantages over other similar undertakings, and having, in addition to the above-mentioned difficulties, to compete for a long period with two or more rival companies, their operations have been in every way prosperous, and there appears no reason to doubt that their success will be maintained. As a remarkable proof of the excellent management and tact displayed by the company, it may be mentioned that, after an opposition of several years, they purchased the undertakings of two of their opponents—viz., that of the Poplar Gas Company, in 1850, for the sum of £12,000, and the British Company, two years later, for £100,000, being about half the original capital.

In 1835 Carter produced and patented his valve for regulating the supply of gas to burners; but, like many other simple and excellent inventions, this valve was not for many years afterwards appreciated at its true worth. In this year Chaussenot patented "an improved construction of the lamps or apparatus used for burning gas for producing a better combustion of the gas." It consisted in the application of two chimneys to the Argand burner, the one being fitted within the other, so that the air necessary for the combustion of the gas passed between them to the flame, and was thus highly heated, increasing thereby the illuminating power of the gas considerably. Other persons have claimed this invention, and in some instances it has been patented; but it has never been generally applied, as the excessive heat causes the inner chimney to melt.

Further improvements in dry meters were introduced at this time by Sullivan, who was followed by Noon, Patterson, Defries, Taylor, and others, all of whose inventions will hereafter have our attention. Amongst the patents for improvements connected with the manufacture of gas, taken out at this period, was that of Burch's double door for retorts. The inner door or partition was formed of fire-clay or iron, and was placed within the retort just beyond the ascension-pipe, the design being, "in the first place, to keep the mouth of the retort and the ascending pipe cool, and, secondly, to confine the heat within the retort as much as is practicable without causing any improper pressure of gas therein." The advantage claimed for this arrangement was "the effectual prevention of the choaking or 'baking up' of the ascending pipes." Although this system has never been practically applied, it appears to present considerable advantages worthy the attention of engineers, more particularly on account of its preventing radiation to a great extent at the weakest point of the retort—the mouthpiece.

(*To be continued*)

GAS LIGHTING, &c., IN FRANCE.

(FROM OUR SPECIAL CORRESPONDENT.)

The following are the most important features of the report of the Paris Company presented at the annual meeting on the 28th ult.:—

The consumption of gas during 1873 amounted to 154,397,118 cubic mètres, or 5,450,888,619 cubic feet (which is an increase of 6,728,787 cubic mètres, or 237,633,841 cubic feet, over that of 1872), in which is included the amount employed daily for heating in industrial and domestic processes, which was 27,998,240 cubic mètres, or 988,786,043 cubic feet; or an increase on 1872 of 1,402,486 cubic mètres, or 49,530,095 cubic feet. The produce of the sale of gas was 38,081,519 francs, or £1,523,260; giving 2,245,351 francs, or £89,814, more than in 1872.

The number of consumers at the end of 1873 was 99,665, or 4891 above 1872—say, an increase of 5 per cent. The number of public lamps was 37,736, or an increase of 1163 on those of 1872. The increase in the producing power of the various works allowed of the production at the end of 1873 of 175,000,000 cubic mètres, and it is capable of almost immediate extension to 185,000,000 cubic mètres. The network of pipes has been increased by 40,306 mètres (25 miles), and is now actually 1,583,335 mètres, or 982 miles. The Paris Company light outside of the fortifications of the city 49 communes, situated in the Departments of the Seine and Seine et Oise. During the year 1873, the special expenses on capital account for the purchase of lands, buildings, &c., was 4,097,564 francs, or £163,902.

The working account of the company for 1873 is stated as follows:—

EXPENDITURE.

Materials Employed, &c.	Francs.		£
Coals, &c.	14,822,128		
Heating. Coke and Tar.	2,796,447		
Gas in hand, Jan. 1, 1872	12,775		
	17,631,350	..	705,254
Cost of Manufacture.			
Salaries and wages	1,610,242		
Maintenance	1,323,164		
Incidental expenses of distillation	867,526		
Purifying	157,595		
Miscellaneous	55,151		
	4,013,678	..	160,547
Cost of Distribution.			
Salaries and wages	792,218		
Maintenance of mains, &c.	386,587		
Miscellaneous	171,358		
	1,350,163	..	54,006
General Management.			
Directors	80,000		
Executive committee	70,000		
Salaries	596,251		
Servants, firing, accidents, insurance, &c.	357,517		
Interest, &c., on loans	4,525,425		
Redemption of shares	1,037,000		
Experiments, &c.	143,102		
Miscellaneous	101,984		
	6,911,279	..	276,451
Municipal Charges			
Tax of 0·02 franc, per cubic mètre	2,654,787		
Rating of mains and cost of lighting, &c., public lamps	577,255		
	3,232,042	..	129,281
State Charges.			
Taxes	337,871		
Miscellaneous	99,467		
	437,338	..	17,493
Giving a grand total of	33,575,853	..	1,343,034

REVENUE.

	Francs.		£
Produce of the sale of gas	38,081,519		
Gas in store, Jan. 1, 1873	11,745		
Retort coke	11,713,128		
Furnace coke	1,093,552		
Tar	1,465,816		
Ammoniacal liquor	239,299		
Artificial fuel	29,840		
Meters	906,286		
Service-pipes, &c.	541,562		
Fittings, stop-cocks, &c.	280,680		
Fire-bricks	123,546		
Chemical products	764,296		
Miscellaneous	149,989		
Interest and discounts	1,028,429		
Grand total of receipts	56,429,691	..	2,257,187
Excess of receipts over expenditure	22,853,837		
Less expenses of liquidation, 1870-2, incurred with the city	253,837		
Total left to be distributed between the corporation of the city of Paris and the company	22,600,000	..	904,000
The company's share for dividends	12,400,000	..	496,000
Difference divisible between the corporation of Paris and the company. This latter sum is equally divided between the two.	10,200,000	..	408,000

The company's net receipts are, therefore, as follows:—

	Francs.		£
Amount brought from above account, as divisible for dividend	12,400,000		
Moiety with the city, as above	5,100,000		
Payment by the city on account of loan	50,000		
Balance of special reserve	454,446		
Total	18,004,446	..	720,177
This admits of payment of a dividend to the shareholders for 1873, at the rate of 52·50 francs per 250 francs share, amounting in all to	17,590,637	..	703,625
Net balance to carry forward	413,809	..	16,552

The report of the directors gives several details of the advantages arising from the introduction of pipes into houses for the supply of separate floors (*conduites montantes*); on the provident-fund, which had an expenditure of 150,472 francs, leaving a balance in favour of 19,000 francs; and on the pension-fund, the assets of which are invested in the shares of the company.

This report is concluded by various remarks on the general manufacture; the state of the coal market, which indicates a fall in price; and the extension of the sale of coke for household use, now increased by the sale of suitable heating apparatus, which had increased in number in 1873 by 2060, and amounted at the end of the year to 36,052. The report states a considerable increase of the profits—viz., 572,269 francs, or £22,890, in 1873, by the treatment of tar and the ammoniacal liquor. The annual production of breeze is stated at 30,000 tons, and an artificial fuel is produced thence, which economizes the use of coke for heating the furnaces and boilers. It also refers to the happy result of the recent vote in the Assembly, which rejected the proposed tax on gas by a majority of 125 votes.

We have just founded in France, under the title of "Société Technique de l'Industrie du Gaz," an association analogous to those which have long existed in England, Germany, and Italy. Its object will be to elucidate, by discussion and joint labour, all questions relating to gas industry, and to assist those of its members who may require its aid. We trust that this association may as rapidly develop itself as yours has, and render eminent services by means of co-operation among its members.

Street loungers have for some days past stopped before a shop in the Rue des Marais, to admire experiments that have been made with a new mode of illumination by the electric light. M. Ladyguire is proposing to extend its use, which has hitherto been chiefly confined to lighthouses. The advantage of his system is that of avoiding the combustion of the charcoal points, which has, up to the present time, been unavoidable in the production of the light. Instead of placing the conducting wires in contact with the charcoal, which is thus ignited and will not last more than six hours, the inventor makes simply a current to pass for heating a series of bodies to a white heat in an atmosphere containing no free oxygen. To easily bring about this result, these graphite points are heated in an atmosphere of carbonic oxide, produced by the combustion of charcoal in a limited quantity of air. After the first trial by the inventor at St. Petersburg, the proprietor of the patent, M. Kosloff, has visited Paris, and, by aid of the fine collection of magneto-electric machines belonging to the Société l'Alliance, he has entered practically into the new method. These machines, constructed by the above-named society, invented by Nollet, and perfected by Joseph van Malderen, are formed of a series of very powerful fixed magnets, in front of which rotate rapidly a series of coils with soft iron cores, which are in an almost constant immediate magnetic contact with the fixed magnets. A three-horse power steam-engine gives sufficient driving power. Four parallel discs, supporting 64 wire-covered cores, rotate in front of 40 magnets, at the rate of 450 revolutions per minute. The illuminating power of one of these machines, as employed in lighthouses, is 250 times greater than that of a Carcel lamp burning 42 grammes of oil per hour.

M. Kosloff's experimental apparatus consists of a glass tube, sealed by a water lute, in which are placed two charcoal points, each from 1 to 2 millimètres in thickness, and 18 millimètres long, grooved into small cubes of graphite, and so attached to the conducting wires of the machines as to allow for expansion, and thus prevent breakage. The passage of the current by the first of the carbons produces a partial combustion, which transforms the oxygen of the small volume of air in the bell glass into carbonic oxide; then, on passing the current only by the second carbon point, a brilliant light is produced which can be made continuous and constant for several successive days, the carbon neither losing weight nor sustaining any molecular change. We have thus seen six lights supplied by the same magneto-electric machine simultaneously, varying in intensity and quantity according to the diameter of the carbon points—say, from 1 to 2¼ millimètres in thickness, and from 18 to 60 millimètres in length. Further experiments will enable us better to ascertain the actual illuminating power, the effect of form on the points, and the expense involved in the driving power for the magnetic machines employed.

Recent marine disasters have called special attention to the great benefits which would arise from the adoption of the electric light on board steam vessels, but hitherto it has been found impossible to change, at once, the charcoal points that have become used up. The oscillation of the vessel has also caused unsteadiness of the light, and diminished its power.

The new invention for keeping up a continuous light with the same charcoal points, permitting also the subdivision of the light, is a great improvement. In coal mines, being not in contact with the

external air, it might with entire safety replace the Davy, affording a brilliant light to the miners. It might also be used as a signal-light on railways. The inventors have in view some modifications which would permit its use in theatres, houses, and in the streets. The engineer-in-chief of the city of Paris is about to experiment on the value of electricity as a general illuminating agent. The apparatus to be employed is that of Klinkerfues, described in this JOURNAL in 1873, at page 232, and which is intended to light gas-jets simultaneously in some of the streets of the capital. In the Chamber of Deputies at Versailles, an electric system of this kind has been at work to light instantaneously all the gaslights of one chandelier; and, in a few seconds, all the lights in the hall, containing 352 jets. The inventor, M. Gaiffe, employs four couples of Leclanché's cells to work a Rhumkorff's coil. The current is passed by conducting wires to each chandelier and each gas-jet, and thus the whole of the latter can be instantaneously lighted. The total length of wire is about 1400 mètres, and *one turn of the commutator* sends the current to the gas-jets. An automatic arrangement, when the light is obtained, intercepts the communication between the battery and the induction coil, and so stops the work of the pile until it is again required, say from one day to another.

Correspondence.

PURIFICATION OF GAS.

SIR,—Mr. George Anderson has published, in your JOURNAL, a summary of a paper on gas purification which he is to read at the next meeting of the Gas Managers Association, and invites consideration and criticism of his proposals. Mr. Anderson is one of the very ablest inquirers in this as well as in other branches of gas manufacture, and I trust he will receive the criticisms which, with your kind permission, I desire to offer, in the same frank spirit with which I have previously accepted his.

I agree with him in the opinion that the recent legislative requirements for increased purity of gas "do not much, if at all [necessarily], increase the cost of purification;" and I confidently endorse his expectation "that many of us will live to see the cost of purification almost *nil*," not only, as he says, "from the utilization of the waste products," but also from a wiser application of the existing means and apparatus.

One improvement of this kind, which I have advocated,* is a mode of employing the ammonia-alkali contained in the gas as a means of taking out the other impurities, all of which are either acids or acidulous. The cost of altering the existing apparatus to carry out this process would be trifling, seeing that the purifiers can readily be converted into washers; and the saving of labour by doing the whole work of purification (subsequent to the condensers) by means of washers, instead of purifiers, is too obvious to need remark.

Moreover, even by a partial application of this process, a great improvement and also economy can be effected in gas purification. The grand object in all such matters is to employ each part of the apparatus or materials at our disposal specifically *to do the work for which it is best fitted*. I shall speak afterwards of the work of cooling the gas and freeing it from tarry matter, but I may observe here that in my opinion scrubbers belong to this *preliminary* stage of purification, and that in all the subsequent operations washers, in the improved form devised by Mr. Anderson, are to be preferred, and in my pamphlet I give reasons for this preference; but, whether washers or scrubbers be employed in ammonia purification, these vessels should be worked in such manner that the alkaline solution which they contain should be devoted specially to the absorption of carbonic acid from the gas, leaving the sulphuretted hydrogen to pass forward, and be dealt with in the subsequent purifying vessels. I have elsewhere shown how this can be done, by turning to practical account the greater affinity which CO_2 has for ammonia and other alkalies than H_2S has. But let me point out some of the advantages of thus employing the apparatus for removing the ammonia in such manner as also specially to decarbonate the gas.†

Firstly, take the case of a gas company still in the "happy land" wherein no "sulphur" maximum exists, and where sulphuretted hydrogen only is dealt with. Then, by working the washers or scrubbers on the above-mentioned system, all, or nearly all, the CO_2 is eliminated in these vessels, with a corresponding increase in the illuminating power of the gas; whilst the whole of the H_2S is thereafter taken out in the ordinary manner by oxide of iron—a material which costs nothing. The advantage here is simply the increase obtained in the illuminating power of the gas by the removal of the carbonic acid.

But this improvement becomes far more important as regards London gas-works, and, indeed, in almost all the gas-works in the large towns of the kingdom, where there is a penal restriction on the amount of sulphur in other forms than sulphuretted hydrogen. And there cannot be a doubt that ere long the purification of gas from bisulphide of carbon, the most stinking of all gas impurities, will be made imperative in all large towns.

Next, then, take the case of gas-works where there is a sulphur maximum, and where lime purifiers have to be used. By working the ordinary scrubbers in this new manner, nearly all the carbonic acid is eliminated in those vessels, and thereby is prevented from entering, and proportionately nullifying, the action of the lime purifiers. This will produce an economy of the lime, while at the same time vastly improving the action of these purifiers upon sulphur in all forms. The lime will be devoted to sulphur purification only, and, by absorbing the H_2S, will be converted into sulphide of calcium to such an extent as simultaneously and thoroughly to eliminate the bisulphide of carbon.

I believe that the best practicable, and the only economical method of purifying gas from "sulphur in other forms than sulphuretted hydrogen," that will ever be found, is by means of the alkaline sulphides properly applied to this work. By my process, which is applicable alike to lime, soda, and ammonia (potash being omitted as too costly), alkaline sulphides can be produced in gas-works by the action of the gas itself, *with perfect certainty*, and absolutely *to any extent or quantity that may be desired*. Now, by decarbonating the gas in the scrubbers, or other vessels employed for the absorption of the ammonia, the quantity of lime at present used in gas-works can be immensely reduced, so as to minimize the nuisance occasioned when this material is used; and in like manner, if soda or decarbonated gas liquor be employed, instead of lime, these materials also are needed only in *small quantity*—namely, simply to remove the bisulphide of carbon, the SH_2 being removed as at present by oxide of iron. The first step is to *produce* the alkaline sulphides by (omitting details) temporarily passing the decarbonated gas from the scrubbers into vessels containing lime, or a solution of soda or ammonia, whereby the contents of these vessels are converted into sulphides by the H_2S in the gas. Thereafter the work of purification proceeds by passing the decarbonated gas from the scrubbers through oxide of iron, whereby all the H_2S is eliminated, and, finally, into the vessels containing the alkaline sulphide, whereby the remaining "sulphur" is likewise eliminated from the gas.

I may here mention that, although I have taken out two patents in connexion with gas purification, my motive was not that of pecuniary profit, but (as I at the time informed several of the London gas companies) to ensure for myself the credit justly due to the solution of the great "sulphur question" which had so long baffled every attempt to devise a remedy.

I agree with Mr. Anderson that, "of the substances *usually employed in the purifiers*, lime is the best." Indeed, in one respect I go farther, for lime is a more potent alkali than either soda or ammonia—which materials, of course, are not included in Mr. Anderson's statement. But there is this drawback, that lime is so imperfectly soluble that it is best used as a solid, and, consequently, forms lumps and nodules, only the surface of which is acted upon; whereas, a solution, as of soda or ammonia, acts far more effectively, besides being employed in washers or scrubbers, the working of which costs almost nothing, and saves the ceaseless labour of emptying and recharging purifiers.

Mr. Anderson's suggestion as to an improved mode of working lime purifiers is so obviously inferior to my process, that, unless challenged thereto, I need not comment upon it. But, with your permission, sir, I would, in conclusion, offer a few observations upon his suggestions relative to what may be roughly called the condensing process.

At an early period of office as a gas referee, my attention was attracted to the importance of beginning the work of purification as soon as the gas left the hydraulic main. This was owing partly to the consideration that tar has an affinity for bisulphide of carbon, but also because there are two distinct purposes to be attained by the "condensers"—viz. (1) the cooling of the gas, and (2) the freeing it from tarry vapour, both of which results are indispensable to secure the efficient action of the subsequent purifying apparatus. Accordingly, in drawing up our "Report on Ammonia Purification," I took occasion to refer at great length to the prior work of condensation. Referring to the report itself for the whole of these remarks, I beg to be allowed to quote the following passages:—

> An adequate condensation of the gas (apart from its advantage as regards the manufacture of gas generally) is, as we have shown, a matter of importance as regards ammonia purification; for, if the gas is not properly cooled before entering the scrubbers, the absorbent power of the water in these vessels is diminished; and if tarry vapour in large quantity is carried forward into the scrubbers, the scrubbing material (as sometimes happens) may be suddenly "fouled" to a degree which seriously affects the purifying action of the apparatus.
>
> The best means of condensation is to be found in the "dry scrubbers" of Mr. Kirkham, and the water-tank process used by Mr. Livesey. The latter process is capable of securing the condensation of the gas in little space and at a steady temperature, whatever be the variations in the external temperature or in the make of gas; and the former, the "dry scrubbers, afford an unequalled means of facilitating the elimination of tar by settling, and also by bringing the tarry vapour into contact with surfaces which promote its deposit. A combination of these two processes would accomplish the work of condensation in a manner which would leave nothing to be desired.
>
> The ordinary system of condensing the gas in pipes of uniform and small size is certainly defective; for, although the *cooling* of the gas may be adequately effected in such pipes, they offer no facility for the mechanical settling or deposit of the tar. Accordingly, the referees consider that, whatever be the method employed for cooling the gas, large chambers ought to be introduced in the condensing pipes, wherein the velocity of the gas stream is reduced, so that the tar may settle down—instead of being carried on, mechanically suspended, in the rapid current, very much in the same way as the mud, which is easily carried on by a rapid stream, is deposited on entering a pool. But this process of deposition is increased, in the "dry scrubbers," by the gas coming at all points in contact with surfaces which promote such a deposit: the tar, in fact, is, as it were, "combed out" of the gas by having to pass through the network of coke with which this condensing apparatus is filled.

Now, compare these remarks (although they are only excerpts) with those of Mr. Anderson, and say whether he proposes anything not distinctly specified and far more fully described in them. All that Mr. Anderson says is as follows:—"The condenser should be much larger than it often is—not, however, for the object of cooling the gas, but to enable it to drop impurities which, if hurried along at a great speed, are carried forward with it into vessels not calculated to receive them." This is a very meagre recommendation compared with the far fuller and more specific suggestions given in the preceding extracts, which are only a part of the remarks on condensation given in the above-mentioned report. Moreover, Mr. Anderson, probably from want of space, omits to point out that separate apparatus is required for cooling the gas from that which is, or ought to be, employed for effectively eliminating the tarry vapour, large pipes or chambers being far less effective than small ones for *cooling* the gas. Hence, as above shown, I proposed the use of different vessels for these different purposes, strongly recommending the water-tank for the cooling work, and large chambers or dry scrubbers for removing the tarry vapour.

The unparalleled failure of the purifying apparatus and processes at Beckton was greatly aggravated by the utterly inefficient manner in

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* *Vide* pamphlet on "Gas Purification in London," a second edition of which, enlarged, is now in the press.

† I observe that Mr. Harris, in giving evidence before the Board of Trade Commissioners (March 13), when asked whether he had tried to decarbonate the gas by means of the ammoniacal liquor (as had been recommended in my pamphlet), replied that he had not; and when repeatedly questioned as to why he had not done so, at length replied that he "had not the means," and that he did not think himself justified in asking his directors to supply the "plant" that would be requisite for trying the process. As regards the working of the ordinary scrubbers in the new manner, no new plant of any kind is required, and very little for adopting the entire process which I have proposed and also explicitly described.

which the work of condensation was attempted at those works. But I may add, as a word of warning to those who may adopt the water-tank for cooling the gas, that they should go to any works (*e.g.* the South Metropolitan) rather than to Beckton, to see how such water-tanks ought to be constructed. At first, as is well known, and as is described in his book on the Beckton works, Mr. Evans attempted to do the work of condensation by *underground pipes* (from which radiation was impossible); and when this proved an utter failure, the water-tank process, which had been *recommended* in our previously published "Ammonia Report," was adopted at Beckton, but in a manner which must have astonished Mr. Livesey, or any one else who had either tried the process or understood it. Instead of being arranged on one plane, as at the South Metropolitan works, the pipes at Beckton are arranged in three tiers, the upper tier containing four pipes, and the lowest only two; so that, when all the pipes are required for the passage of the gas, the largest quantity must pass through the pipes near the surface of the water, where the water is hottest, and the least quantity through the pipes at the bottom, where the cold water lies; and in summer, when the make of gas is small, the whole of the gas will naturally and inevitably pass through the upper pipes, where the water is at its hottest. In fact, the whole arrangement at Beckton is a striking proof of how a really good process may be converted into a bad one.

21, *John Street, Adelphi, London.* R. H. PATTERSON.

LEAKAGE.

SIR,—Will you allow me to ask Mr. Methven a question, through the columns of your JOURNAL, relative to the tables published in the JOURNAL for the 24th of March, on the subject of leakage? Will he explain why the average leakage for the five years before the remodelling of the works is so much below the five years after the works have been remodelled, with the quantity of gas sold nearly doubled?

Gas made per ton of coal before the alteration . .	10,177	feet
Gas brought to charge	9,055	,,
Leakage	1,122	,,

Over 11 per cent.

Gas made per ton after the alteration	10,458	feet
Gas brought to charge	8,973	,,
Leakage	1,485	,,

Over 14 per cent.

The quantity of gas made or sold per ton of coal must depend upon the quality of such coal. I have been trying for a number of years to increase my make per ton of coal, but I have not yet got to 9000 feet per ton.

Railway Terrace, Rugby, March 28, 1874. PETER SIMPSON.

"LONDON" ARGANDS *v.* SILBER BURNERS.

SIR,—Your report of the observations made by Lord John Hay, the chairman of the Silber Light Company, Limited, at the meeting of the company on the 16th ultimo, and your brief comments thereon, in your "Circular to Gas Companies," on the 24th ultimo, have together given occasion to Mr. Sugg to address to you a communication that has occasioned me no small surprise. I fancy that the writer must have somewhat mistaken the scope and nature of his patents, which, whilst they secure to him the undisputed and exclusive privilege of manufacturing and selling certain articles, in no way constitute him the sole judge of the improvements made by others, nor entitle him to instruct the "gas world" concerning the precise degree of excellence in burners at which it behoves all persons, whether manufacturers or consumers, to "rest and be thankful."

Mr. Sugg, in the first place, comforts himself with a hope which I hasten to dispel. He fancies that the improvement promised by the noble chairman is really too great to be realized in practice, and he suggests that "a meaning will be given to his statements which I do not think he meant to convey." The meaning intended to be conveyed by your report and observations was quite correct, and may be stated more explicitly by quoting the very words of the letter from Mr. Valentin, which the chairman read to the meeting. That letter is as follows, and I think Mr. Sugg will find that it is not susceptible of more than a single interpretation:—

> I beg to report to you on the merits of two kinds of gas-burners—the Argand and bat's-wing. The burners were subjected to a series of most exhaustive and rigid tests, and it follows from these experiments:—1, that 4 cubic feet of gas give as much light as 5 feet given by the most perfect ordinary test burners; 2, that the light is white—proof of more perfect combustion; 3, that the flame is steady and uniform in character; 4, the common gas is placed on a level with the more expensive cannel gas, and there will be no longer necessity for the use of the more expensive cannel coal; 5, a saving of from 20 to 25 per cent. is placed within the reach of the consumer, taking the Argand burner as the test of the comparison; but, considering that the ordinary burners scarcely ever give more than 10 or 12 candle light, the saving effected is about 50 per cent.
>
> March 5, 1874.

Before proceeding to the substance of Mr. Sugg's letter, I must beg leave to correct an inaccuracy which has nothing to do with gas-burners, but which is not without its significance as a sign of inaccurate habits of mind in other respects. Mr. Sugg speaks of the chairman of the Silber Light Company, Limited, as Sir John Hay. The actual chairman is Rear-Admiral Lord John Hay, C.B.; and Sir John Hay, who is a totally different person, has no connexion of any kind with the company.

Turning now to the real questions at issue, I find Mr. Sugg saying that, "naturally," the burner mentioned as the ordinary burner "is supposed" to be the London Argand, and expressing his belief that the chairman "did not mean anything of the sort; nor that the saving of gas by the new Silber burner amounted now to about 50 per cent." It is quite true that neither the chairman nor Mr. Valentin mentioned the "London Argand burner" by name; but, as Mr. Sugg has himself done so, I may at once say that this burner, and no other, was that to which their observations were intended to apply. The reason for their reserve was simply that it is not the custom, in the higher commercial circles, to introduce into prospectuses or descriptions the names of other traders in the same department of business. Mr. Sugg's doubt as to the burner intended could only arise, however, from his own extreme modesty; for, although in his paper published in your JOURNAL of Oct. 21, 1873, he said of two burners—one of them being of his own contrivance—that "they do not develop the full illuminating power of the gas which is tested by them, and therefore ought not to be accepted as standard burners by the official gas examiner, neither are they at the same time the best burner for the consumer," he must surely be aware that his "patent London improved burner, as made now" (I quote from his own catalogue), "has been universally accepted as the most perfect ordinary test-burner," and is the only one that Mr. Valentin would be at all likely to use. It is true that we expect it to be speedily dethroned from that position, for it strikes me forcibly that any success which he has attained in making burners must have been the result of chance—experiments with some lucky combinations. If he had mastered the principles upon which the proper combustion of gas depends, he would be able to produce burners which give for 5 feet of gas (as ordinarily supplied by the Chartered Company to the City) a light equal to 22 sperm candles, and, for a larger consumption, a proportionate increase.

After casting this wholly unreasonable doubt upon the meaning of plain words, Mr. Sugg proceeds to suggest that the improvement mentioned would, if it were realized, be injurious to gas companies, and that it would lead to "there is no saying how many per cent. of gas and *gas managers* being entirely dispensed with." This is an endeavour, doubtless well meant from Mr. Sugg's point of view, but surely too transparent to deceive anybody, to enlist gas managers upon his side in a competition that must, he foresees, be disastrous to his interests. There is an under-current of alarm running through the whole sentence, and a certain piteousness in the appealing cry with which it concludes, that almost lead me to believe that Mr. Sugg, by some means unknown to me, has been able to witness the action of a Silber burner, and that he is only too well aware of the change that it is soon about to accomplish. If he is really in any doubt or suspense upon the question, it will be only kind to terminate it, and for this purpose I may refer him to several of the directors of the Imperial Gas Company, who, at their own works, have seen a Silber burner, consuming 4 cubic feet of gas per hour, give precisely the same light as a patent London improved burner consuming 5 cubic feet. If any confirmation of the correctness of Mr. Valentin's work were needed, that confirmation has been furnished by Dr. Letheby, whose profound knowledge and scientific accuracy are well known to Mr. Sugg and to your readers, and require no description from me. Dr. Letheby and Mr. Valentin were once pursuing, at the same time and unknown to each other, experimental researches into the value and effects of some of my oil burners—Mr. Valentin at my application, Dr. Letheby merely for his own amusement and information. Dr. Letheby was kind enough to send me the numerical results at which he had arrived, and they tallied with those of Mr. Valentin in every particular. It is obvious that every burner which improves the quality and diminishes the cost of light must, at the same time, increase the demand for the illuminating agent. When the Silber burner comes into general use, consumers, habituated to good light and plenty of it, will probably burn much more gas than they did before. The interests of gas companies and of gas managers will alike be promoted by the change, and the only difference will be that the demand for Mr. Sugg's own burners will be reduced in no doubtful proportion, but by exactly 100 per cent.

Mr. Sugg next appeals to the gas world to defer their judgment upon the respective merits of the Silber and the London burner. Surely this appeal is unnecessary, for the gas world cannot possibly form a judgment upon that which is not at present before them. The Silber burner will not be sold until it can be supplied continuously in numbers sufficient to meet the expected demand; and, until then—that is, until the month of May—all judgment about its merits must be deferred as a matter of course. It would have been better, I think, if Mr. Sugg himself had waited these few weeks before rushing into print. He would then have had the burner before him, and would have been able to test and to criticize it at his ease.

The rest of his letter is simply an advertisement of his own wares. The account given of the performances of his burners would require no examination, if it proceeded from Dr. Letheby, or Dr. Frankland, or Professor Tyndall, or Mr. Valentin, or any other man of science. But proceeding, as it does, from a trader, it falls into the category of ordinary puffing, and as such requires no notice from me. I must remark, however, that Mr. Sugg characterizes certain people—I do not quite know who they are—as the "opponents" of gas companies, just as in his former communication, to which I have already referred, he speaks of other burner makers as "the enemy." Let me tell him that in fair trading there are no enemies. Men of business recognize only competition; and they regard all honest competitors as fellow-workers and friends. When feelings of enmity arise in the conduct of commercial transactions, they generally show that those who indulge in them have overstepped the limits of fair trading, or have sought to secure for themselves advantages to which they had no valid claim.

49, *Whitecross Street,*
April 4, 1874. A. M. SILBER, Assoc. Inst. C.E.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, MARCH 30, 1874.

Petitions were presented against the Dublin Corporation Gas Bill, by Great Southern and Western Railway Company; and against the Wrexham Water Bill, by T. E. Withington and another.

HOUSE OF COMMONS.

MONDAY, MARCH 30, 1874.

The following Bills were read a second time:—Dundee Water; Truro Water; Wigan Improvement.

Petitions against the following Bills were presented:—Birmingham Gas, by Robert Perles Yates; Dublin Corporation Water, by Great Southern and Western Railway Company; Edinburgh and District Water, by Robert Craig and Sons; Hythe Improvement and Water, by owners, &c., of property in Saltwood; Tunbridge Wells Gas, by Tunbridge Wells Local Board of Health; Wakefield and District New Water, by Midland Railway Company; Wakefield Water, by Midland Railway Company and Sir Lionel Milborne Swinnerton Pilkington, Bart, and Thomas Fletcher Twemlow.

TUESDAY, MARCH 31.

The following Bills were read a second time:—Airdrie and Coatbridge Water; Birmingham Gas; Fylde Water; Grantham Gas; Padiham Water; Tunbridge Wells Gas; Wakefield Water.

The Standing Orders Committee reported—"That, in the case of the Broadstairs Water (No. 2) Bill, the Standing Orders ought to be dispensed with; that

the parties be permitted to proceed with their Bill." "That, in the case of the Metropolis Gas Bill, petition of George Flintoff, for reinsertion of the petition for Bill in the 'General List of Petitions,' the Standing Orders ought not to be dispensed with."

METROPOLIS WATER SUPPLY AND FIRE PREVENTION.—Leave being given, a Bill "for making more effectual provision for a constant supply of water, and for the protection of life and property against fire in the metropolis" was introduced by Colonel Beresford, and read the first time; to be read the second time on Tuesday, May 5.

A petition in favour of the Wakefield Water Bill was presented by the Corporation of Wakefield.

Petitions against the following Bills were presented:—Aberdare and Aberaman Gas, by ratepayers and consumers of Gas in Aberdare; Belfast Water, by Alexander Taylor and Robert MacMurray; Birmingham Gas, by Henry Wright and Birmingham and Staffordshire Gaslight Company; Dublin Corporation Water, by Dublin, Wicklow, and Wexford Railway; Edinburgh and District Water, by Duke of Buccleuch and Queensbury, Marquis of Lothian, Robert Dundas, Trustees and Local Authority of Dalkeith, and North British Railway Company; Horbury Local Board, by Lancashire and Yorkshire Railway Company and Corporation of Halifax; Hythe Improvement and Water, by Lords Bailiff and Jurats of Level of Romney Marsh; Musselburgh and Dalkeith Water, by Mid Lothian Water Company; Padiham Water, by Padiham and Hapton Local Board and James Bear; South Lancashire Water, by Blackrod and Adlington Local Boards; Tunbridge Wells Gas, by John Heugh; Wakefield and District New Water, by Lancashire and Yorkshire Railway Company, Corporation of Doncaster, Corporation of Sheffield, and Corporation of Wakefield; Wakefield Water, by Lancashire and Yorkshire Railway Company, Corporation of Doncaster, and Corporation of Sheffield; Wigan Improvement, by Hindley Local Board and Wigan Gas Company.

WEDNESDAY, APRIL 1.

Petitions against the following Bills were presented:—Belfast Water, by Carrickfergus Commissioners, inhabitants of Carrickfergus, Marriott Robert Dalway, Barry Martin Smyth, and owners and occupiers of property in Belfast; Chester Water, by Corporation of Chester; Dublin Corporation Water, by Alliance and Dublin Consumers Gas Company and Commissioners of Kingstown; —Edinburgh and District Water, by Corporation of Leith, Mid Lothian Water Company, and R. B. Wardlaw Ramsay, Caledonian Railway Company, Earl of Dalhousie, Edinburgh and Leith Wine, Spirit, and Beer Trade Association, and others; ratepayers, &c., in Edinburgh, and others: Walter James Little Gilmour, and Musselburgh and Dalkeith Water Trustees;—Grantham Gas, by consumers of gas, &c., in Grantham; Hythe Improvement and Water, by South-Eastern Railway Company; Lymm Water, by London and North-Western Railway Company; Padiham Water, by Henry Helm and others: Peterborough Gas, by Peterborough Improvement Commissioners; South Lancashire Water, by Wigan Rural Sanitary Authority (Township of Aspull), and Wigan Rural Sanitary Authority (Township of Haigh); Truro Water, by Corporation of Truro; Ulverston Local Board, by Ulverston Gas Company and Barrow-in-Furness Corporation; Wakefield and District New Water, by Baron Middleton and the Hon. James William Macdonald; Samuel Fox and Company, Limited; owners, &c., of steam-engines, works, and property on the river Dun; Penistone Local Board, Thurlstone Local Board, and owners, &c., of mills and works on the river Dun;—Wakefield Water, by Baron Middleton and the Hon. James William Macdonald; promoters of "Wakefield and District New Water" Bill and others; Samuel Fox and Company, Limited; owners, &c., of steam-engines, works, and property on the river Dun; Penistone Local Board, Thurlstone Local Board, Messrs. J. H. and G. Fountain; owners, &c., of mills and works on the river Dun; Calder and Hebble and Aire and Calder Navigation Companies, and London and North-Western Railway Company;—Waterford Gas, by Corporation of Waterford; Wigan Improvement, by Pemberton Local Board, and Lancashire and Yorkshire Railway Company.

A petition was presented against the Edinburgh and District Water Bill, by the provost, magistrates, and Town Council of Musselburgh, the petitioners not praying to be heard.

Miscellaneous News.

CITY OF LONDON GAS ACT, 1868.

BOARD OF TRADE COMMISSION.

On Wednesday, the 1st inst., the commissioners appointed by the Board of Trade, on the application of The Gaslight and Coke Company, for a revision of price, intimated their decision that for the current year the price to be charged for gas of 16-candle illuminating power shall be 5s. per 1000 cubic feet; and for cannel gas, of 20 candle power, 6s. 3d. The terms of the award and the accompanying memorandum will shortly appear.

WEST OF SCOTLAND ASSOCIATION OF GAS MANAGERS.

The Fourth General Meeting of this Association was held in the Town-Hall, Hamilton, on Thursday, March 26—Mr. WILLIAM KEY, of Dumbarton, president, in the chair.

The PRESIDENT, before proceeding with the business of the day, congratulated the members on the very comfortable arrangements that had been made for their reception on this occasion. He was sure every one present would feel proud to meet in such an excellent hall, and under the patronage of the municipal rulers of the royal burgh of Hamilton, many of whom were present. He moved a very hearty vote of thanks to them, which was accorded with acclamation.

The minutes of the last meetings having been taken as read,

The PRESIDENT proposed, as an honorary member of the society, Mr. B. M. MacCrae, of Dundee, who was unanimously elected. He also, in the name of the committee, proposed as extraordinary members the following gentlemen:—Messrs. W. S. Brown, Glasgow; William Wood, Renfrew; Thomas Watson, Lanark; Alexander M'Ara, Glasgow, who were also unanimously admitted.

The following gentlemen were then admitted as ordinary members, they having applied to become members since the last meeting in Glasgow:—

Mr. William Ewart, Annan.	Mr. J. Nisbet, Ballycastle, Antrim.
Mr. Wm. Wilkinson, East Linton.	Mr. J. Skinner, Blantyre.
Mr. R. M. Turner, Inneskillen.	Mr. P. Chamberlain, Clones, Mon.
Mr. L. Monk, Lanark.	Mr. J. Sinclair, Stonehouse.
Mr. Alex. Scott, Markinch, Fife.	Mr. T. Fotheringham, Bdge of Allan.
Mr. D. Stevens, Pittenweem.	Mr. Robert Guthrie, Dunblane.
Mr. John Adamson, Anstruther.	Mr. Andrew Wilson, Stewarton.
Mr. Wm. Smith, Newton, Ayr.	Mr. P. McFarlane, Port Glasgow.
Mr. R. Carlow, Port Glasgow.	Mr. J. Richmond, Whitburn.
Mr. A. White, Blythswood.	Mr. Andrew Duncan, Langholm.
Mr. W. Drummond, Coatbridge.	Mr. Robert Caldwell, Glasgow.

Mr. SMITH (Helensburgh) then explained the object of the benevolent-fund in connexion with the association, and moved the following motion:—"That this association issue circulars to gas managers (not already contributors), gas companies, directors, gas engineers, manufacturers, and others, calling attention to the object of the benevolent-fund in connexion with this association, and appeal to them to aid this institution by contributing the present payment of a sum of 20s. to the benevolent-fund; and that, in consideration for such donation, one copy of the annual report on the gas supply of Scotland will be sent annually to the address of donors (free of expense) for every such sum received; and also that this meeting resolve to advertise the same in the JOURNAL OF GAS LIGHTING." He remarked that this fund had progressed hitherto in a satisfactory manner, but that it was advisable to make an effort to provide something substantial for the future, and pointed out that the character of the fund was purely benevolent—not of the nature of a friendly society, in which every member had his claim—but that its distribution was left to the committee to judge of the merits of each application. He thought that companies might contribute as well as managers, because the interests of one class were closely connected with those of the other.

Mr. LEARMONT (Milngavie) seconded the motion, which was put and carried by acclamation.

The PRESIDENT said he felt pretty confident that, by this step, the benevolent-fund would obtain £500 to £1000. This was the only society of gas managers having such a scheme, and indeed this was only in its infancy, yet in one year they had made grants amounting to £20. He thought there was little doubt that in their efforts to raise a proper fund they would be met in a generous and benevolent spirit, which feeling in itself would afford ample satisfaction to the donors. It was not a thing to be desired that when individual cases of necessity arose, appeals should be made by circulars to raise a sum of money. It was a much better plan to establish a fund amongst themselves, from which immediate relief could be given, without publishing abroad the name and circumstances of the recipient.

It was then put to the meeting whether there were any members present who would like to be supplied with the JOURNAL OF GAS LIGHTING weekly, according to the method adopted by the association, when five names were given in, making 41 members who were thus supplied. The JOURNALS which had been in circulation for the past and present years were then offered to the members for a small sum per volume, and fully taken up; and the secretary was instructed to inform the readers to forward them as read to the purchasers weekly.

Mr. A. BROWN (Kilsyth) proposed, and Mr. WM. SMITH (Helensburgh) seconded, that a sum of £5 be bestowed on the widow of a deceased gas manager, which was agreed to.

The PRESIDENT then put it to the meeting to fix on a town for holding the annual meeting of the society, to be held in June next.

Mr. MALAM invited the association to Dumfries. He would have pleasure in entertaining them, besides showing them the working of his patented process.

Mr. HUNTER (Rothesay) said he had to lay before the association an invitation to the town of Rothesay, when the town hall would be open to them, and explained how easy of access it was from Glasgow, by Wemyss Bay train. The towns of Stirling and Dumfries, however, were held in greater favour by members, and, when put to the meeting, it was decided in favour of the latter, the next general meeting to be held there in the month of June.

The special business of the meeting was then opened by the PRESIDENT addressing the members as follows:—

Gentlemen,—I have the honour and pleasure of again meeting you all at this, the opening meeting of our second session. We are met together here to-day as fellow gas managers and members of this West of Scotland Association, with the object, as our rules have it, "of promoting the circulation of knowledge among its members in all matters connected with gas manufacture and management, to encourage exchange of opinions, and the advancing of subjects of debate, to the smallest detail in connexion with gas manufacture in small works." And, as it is customary to offer a few remarks from the chair on such occasions, I will do so shortly. I am happy to open our proceedings by congratulating the association on the continued addition to its members. At our first quarterly meeting, at Kirkintilloch, at this time last year, our membership was 36; and the new members in one year till this date number 78, thus making 114 names on the roll at present. Seeing that this society is constituted to represent managers of the lesser works, and combines many institutions most valuable to members, I confidently predict for it a still greater strength, usefulness, and support, not only in Scotland, but (as we have to-day seen) from our sister countries also.

Since we last met, the statistical report then promised you has been issued, to which your committee deemed it necessary, at a later month, to add a supplement. These have been gladly welcomed by all, and from some members we have had letters in which suggestions were made for additional columns. We invite criticism and recommendations before September (after which this year's report will be issued), which will be duly considered, and you may rely on the committee using discretion in abstaining from inserting what would in any way tend to pit works against works or manager against manager.

At this meeting will be handed to each member his copy of "Report of Proceedings at the Meetings of the Society in Kirkintilloch, Ayr, and Glasgow, for the year 1873," in one pamphlet. There are at present 36 of our members who receive our circulating copies of the JOURNAL OF GAS LIGHTING weekly, and I am glad to learn there are still a few more who are desirous of taking advantage of this institution.

It is also matter for gratitude and congratulation that this association has established a "managers" or "benevolent fund," the value of which is at once shown by our having been enabled therefrom to send to necessitous parties, in one and our first year, the sum of twenty pounds. This fund has received laudable support from English firms, and on your committe being made aware of the necessitous conditon of an aged and worthy brother and late member of our profession in England, they at once remitted the sum of £10. The usefulness of this fund is thus made apparent by our being enabled in all cases to give *immediate* relief, instead of waiting until subscriptions are collected, and you will concur in the truth of the remark made by the worthy secretary of the British Association of Gas Managers, that "the steed might be starving while the grass was growing."

The committee have approved of the motion brought forward by Mr. Smith, of Helensburgh, for endeavouring to obtain, by sums of 20s., such an amount as will put this scheme beyond the vicissitudes of "chance support;" and as this is the only society in connexion with gas managers having such a fund, we are quite prepared to enter into it on the broad principles of the greatest of the three virtues, knowing that in like manner shall we receive support even from the Shetland to the Channel Islands.

Our prospects, on the opening of this session, for the supply of coal for the following season, are very conflicting and unsatisfactory, for while we entertain hopes of a reduction of 10 or 20 per cent. in the price, we are made aware of impending scarcity through the discontent among colliers. I am inclined to think the latter must succumb to the not very extortionate requests of the masters, seeing so many iron-works have damped up. We may, I think, give expression to the opinion that, by late changes, the private property of individuals will be better protected from unwarrantable confiscation, which has been all the mania in connexion with gas undertakings for some time back; and this may be a matter of some satisfaction to shareholders.

At our last meeting, in September last, I very strongly advocated the equalizing of the illuminating power of gas over the whole of Britain, and in this opinion I have been borne out in editorial articles in pages 177 and 178 of this year's JOURNAL, the correctness and propriety of which cannot be doubted. And I again urge on your notice the necessity of reducing the illuminating power of our Scotch gas by working up large quantities of our plentiful common coal, which will yield between 9000 and 10,000 cubic feet of 14 or 15 candle gas, and with a proportion of our second quality of cannel, so as to raise the

average illuminating power to 18 candles at most, which ought, with the proper burners, to give general satisfaction.

In support of this recommendation I think you will find it an undisputed fact that, were you to take 100 average consumers lights in any town of Scotland supplying 28-candle gas, and were it possible for you to convey them individually to your photometer-bar, I will guarantee that 70 out of every 100 would be found giving a light of less than 8 candles, with which the consumers seem quite pleased.

I can see nothing but absurdity in our paying for such high-class coals as we do—knowing, too, that these coals in 12 years may be pretty well wrought up—to supply a quality of gas that we never take advantage of; nor do we use a burner to consume more than a volume sufficient to give a light equal to 8 or 10 candles at each jet.

When across the Border lately, I was struck with the brilliancy of the lights compared with those in our own dwellings, and on inquiry I found the gas to be of an illuminating power of from 14 to 18 candles.

Let us, then, direct our attention to the supply of 18-candle gas, with Bray's regulator "enamel" burners Nos. 3 and 4, and with little or no pressure at the point of combustion. Our lighting will then be more consistent, compared with our present system of manufacturing gas so rich in light-giving properties, and after it is made not selling it in a worthy and profitable manner. If we sold 18-candle gas in Scotland, and it was consumed as it ought to be consumed, it would dazzle the eyes of the beholders, and reflect from the recesses of the shareholders pockets.

Amongst the managers of the lesser gas-works in Scotland there is at the present time a great craving for information in all the branches of their profession, such as, I believe, never was so unanimously felt before; and it affords me much pleasure to believe that this society has mainly been the cause. We are aided in our efforts most materially by the circulation of the JOURNAL OF GAS LIGHTING, and I am glad to notice that the proprietors of that esteemed JOURNAL have begun to publish "A Treatise on the Science and Practice of the Manufacture and Distribution of Coal Gas." At present we have received as far as the sixth article of a valuable historical introduction, and I can fancy how many are anxiously waiting to study the "science and practice," which will be more acceptable to such as we than if the whole contents of the JOURNAL were devoted to parliamentary reports and half-yearly meetings of metropolitan gas companies.

I consider it the duty of gas managers and engineers to publish through the columns of the JOURNAL, which is our recognized standard medium of communication, information in gas matters, their discoveries and new and improved modes of working, for the acceptance or improvement on them by others; and I would suggest that, if possible, these "communicated articles" ought to be in one paper, and never divided over more than two issues, so as to avoid persistent snaps at scraps of statistics begun, it may be, a year ago, in one JOURNAL, and still going on, tumbled in now and then promiscuously, so that to read a single article of these is calculated to puzzle more than edify; whereas, if inserted otherwise, it may prove a paper of some value.

The leading new feature that has been described in the JOURNAL OF GAS LIGHTING since our last meeting is a very compact apparatus designed by Messrs. Pelouze and Audouin, of Paris, for mechanically condensing liquefiable matters held in suspension in gases, and which has proved a complete success. I have also to notice from the public papers that Dr. Wallace, of Glasgow, at a meeting of the Philosophical Society, stated that of all the lamp-regulators proved by him, those made by Messrs. D. B. Peebles and Co., of Edinburgh, were the best. It is important to know this, as we all agree that great saving is effected by their use.

The papers before us to-day come very suitably before alterations on our works are made for the ensuing season.

Mr. MALAM (Dumfries) read the following paper on

AN IMPROVED METHOD OF CARBONIZING COAL, WITH COMPARATIVE STATISTICS.

Since the 15th of March, 1873, when, at a meeting of this society, held at Kirkintilloch,* I had the pleasure of submitting a short communication regarding the new condensing and washing mouthpiece, and other improvements in the manufacture of illuminating gas, as patented by me, the utility of the invention has been practically and satisfactorily tested at the works of the Dumfries Gaslight Company, and the result of that test I propose briefly to communicate to you to-day. But before doing so, allow me to recall to your recollection a few of the principal advantages claimed by my invention. As I then pointed out, in working at high heats, hitherto insurmountable difficulties had been encountered, in the liability to deposition of earthy matters in the ascension-pipes, causing choking of the same, thus necessitating interruption in the working, and consequent loss; whilst bear in mind that the inability to extract from coal at low heats the full amount of gas contained therein, has long been a recognized fact. By one improvement comprised in the invention, the difficulty met with, in using increased heat, is overcome by cooling the ascension-pipes, and the part of the mouthpiece of the retort to which the ascension-pipe is attached, a trough is formed in the mouthpiece, and round the ascension-pipe, and a regular supply of water is constantly supplied to the trough, which keeps the mouthpiece and ascension-pipe comparatively cool, and thereby prevents the adherence of earthy matter to the interior of the mouthpiece; and there is also a continuous shower of water down the interior of the ascension-pipe, and through the mouthpiece, which materially assists in the cooling process, whilst at the same time contributing to the washing of the gas and condensation of the undecomposed hydrocarbons. In addition to this, the gas is passed over or through incandescent coke or brick, in the end of the retort nearest the improved mouthpiece, which arrests and decomposes those liquid hydrocarbons which would otherwise go to form tar.

So satisfied were the directors of the Dumfries Gaslight Company of the great saving effected, as demonstrated in the works, by the use of the condensing mouthpiece, attached to the ordinary single retort, that they caused the whole of the benches to be rebuilt, and fitted up with the patent apparatus, adopting the double-ended retorts, which are undoubtedly the best. Being thus in a position to test the merits of the invention in a thoroughly practical manner by actual working, the following statistics, extracted from the company's books, prove beyond a doubt its immense success:—I find that during the three months ending Jan. 1, 1872, there had been carbonized at the Dumfries works 1637 tons of coal, producing, as indicated by station-meter, 14,790,000 cubic feet of gas, or at the rate of 9024 feet per ton; this was by the ordinary method of carbonizing, and previous to the application of any part of my improvement. During the corresponding three months of next year, which ended Jan. 1, 1873, when only a portion of my improvement had been added to the works, the number of tons of coal carbonized was 1335, producing 13,510,000 cubic feet of gas, or at the rate of 10,119 feet per ton. In the corresponding months ending Jan. 1, 1874, with the full adoption of every improvement, as contained in the patent specification, there were carbonized 951 tons of coal, which yielded 12,530,000 cubic feet of gas, or at the rate of 13,175 feet per ton, or an increase in the yield per ton of 4141 cubic feet, as compared with the working of the old process, during the last quarter of 1871. Keeping in mind the number of tons of coal carbonized, the saving effected at the Dumfries works, during the last three months, has been 3,938,091 cubic feet, representing 298 tons of coal, which average 40s. per ton upon the works, amounts to £596. During the time already specified, the same description of coal has been used—viz., one-third best Scotch cannel, and two-thirds common cannel.

The gas produced by the new process is equal in illuminating power to that of the old, as proved by the bar and jet photometer, averaging from 27 to 28 candles; it is also more permanent. An analysis by Dr. Stevenson Macadam shows that in the tar produced by this method very little of anything out of which gas can be produced is left, the decomposition of the hydrocarbons being of so destructive a character. The analysis is as follows:—

Analytical Laboratory, Surgeons Hall, Edinburgh, March 14, 1874.

I have carefully analyzed a sample of gas tar forwarded to me by Mr. A. Malam, engineer of the Dumfries Gas-Works, and find it to differ from ordinary gas tar in being more dense (specific gravity 1045, water being 1000), in containing only 2 per cent. of the lighter naphthas, and in consisting mainly of the heavier tar matters, such as naphthaline, carbolic acid, pyren, and chrysen. The gas tar under examination is therefore practically only of value as a source of dead oil and pitch. All the lighter naphthas have apparently been removed in the illuminating gas.

(signed) STEVENSON MACADAM, Ph.D., F.R.S.E., F.C.S.,
Lecturer in Chemistry.

I may mention that in the washing and condensing of the gas, a green colouring matter is produced, which is carried by the water into the cisterns below the mouthpiece, and thence to the tar well. This matter turns black (oxidizes) by the action of light, and falls down as a sediment. This is no doubt the basis of a colour, and is well worth the attention of the scientific chemist.

I have thus pointed out to you the advantages of the new system over the old in the manufacture of illuminating gas, and in doing so I have been careful to over-estimate nothing, preferring to speculative theory, the incontrovertible evidence of practical fact.

The PRESIDENT observed that, at this time last year, the subject of Mr. Malam's paper was taken very cautiously by the society, it not being accompanied with statistics, but now the facts laid before them spoke for themselves.

Mr. MALAM said, at Kirkintilloch, the managers thought that the gas made by his process would be of a less illuminating power. But not only did he make 2000 feet per ton more than any other man, but he was getting even 2400, without any deterioration in quality. The gas also was more permanent, there being little or no condensation, the oily matters were all thrown into gas, and did not fall down.

The PRESIDENT asked whether Mr. Malam had erected his patent ovens in any other works except Dumfries.

Mr. MALAM: Not yet; but I have contracted for several.

The PRESIDENT said, as regards condensation, his experience bore out that of Mr. Malam; for, while working with such high heats as to take off 13,500 feet per ton from a fair mixture of gas coals, so that nothing but pitchy matter and almost pure water came off the hydraulic main, and thus forming into permanent gas all the benzole, naphthas, and light tarry matters, he found that his leakage, from unaccounted-for gas, between the volume registered by the station-meter and the volume sold, was decreased—a result much against his expectation. He thought that, by gas being made of these light volatile oils, he should have much more condensation between holders and consumers meters, but his leakage over the year was reduced to 2½ per cent. In fact, he had sometimes been unwilling to say how little leakage he had, for this was sometimes due to a lowering of the level of water-line in station-meters, in which case so much gas per ton would not have been registered.

Mr. MALAM, in reply to a question, said the expense of the new fittings would be paid for in three months. He could promise a gain of 10 per cent., and the gas could be carbonized just as much as was thought proper. If not so much gas per retort was wanted, more incandescent coke was left in, and a less charge of coal was employed. If more gas was required, they must keep in less coke and put in more coals. He did not now use the cups for the water, but merely took off the retort-lid, and scraped out the mouthpiece on that end of the retort every three days.

Mr. LEARMONT asked how often the incandescent coke was taken out.

Mr. MALAM said he kept it in a fortnight, but stirred it up every three days although he had allowed it to remain for three weeks; in that case, however, it became very hard. In reply to the president, he stated that he had used similar coals for the past three years, and handed a list of the various kinds, which the president read to the meeting, but acknowledged that he was unacquainted with them.

The PRESIDENT: said it appeared, by this method, more gas was obtained, and Mr. Malam had assured them of an increase of 10 per cent. in dividends. Of course, he was aware that some companies had a very large capital compared with the size of the undertaking, and upon it could never declare but a small dividend; and that other companies, more fortunate, had a small nominal capital upon which it was not so difficult to declare a fair dividend, and he presumed that what was meant was, an average increase of 10 per cent. on profits.

Mr. MALAM: Mine has a dividend of 23 per cent.

Mr. MARTIN: In what manner and at what expense could an old-fashioned oven be altered to your method?

Mr. MALAM stated that his benches cost £40 each—iron retorts, bricks, and labour included.

The PRESIDENT expressed his opinion that at present it would cost more for new mouthpieces and other ironwork, and the building, &c.—it might be nearer £100.

Mr. MALAM repeated his statement, and said that, at any rate, the expense would be cleared in three months.

Mr. HALL (New Milns): What do you charge for the right of patent?

Mr. MALAM said 1s. per ton of coal made into gas. A special agreement with companies could be entered into. Glasgow might save £70,000 a year by its adoption.

A vote of thanks was given to Mr. Malam for his paper.

(To be continued.)

* See JOURNAL OF GAS LIGHTING, No. 536, April 15, 1873, page 324.

INSTITUTION OF CIVIL ENGINEERS.—At the meeting of this society, on Tuesday, the 3rd inst., Mr. James Alkin Paskin, resident engineer of the Halifax Corporation Water-Works, was elected a member, and Mr. Oswald Brown-Stud. Inst. C.E., resident engineer of the Galatz Water-Works, was elected an associate.

GLASGOW WATER SUPPLY.—The water from Loch Katrine supplied to Glasgow during March, according to the report of Professor Bischof, of the Andersonian University, was as usual entirely free from any trace of "previous sewage or animal contamination," although it evidently contained a large proportion of surface water.

RESIGNATION OF THE MANAGER OF THE KINGSTON GAS COMPANY.—The *Surrey Comet* says: "Mr. W. C. Watson, who for the last four years has filled the office of engineer and manager to the Kingston Gas Company with great credit to himself and to the entire satisfaction of the directors and shareholders, has accepted the very important post of manager of the gas-works at Monte Video. Mr. Watson has had much experience with the making of gas, not only here but abroad; and if he is as successful in his efforts at Monte Video as he has been at Kingston, his new directors will have great cause for congratulation at obtaining so intelligent and practical a manager. Mr. Watson will leave this town with the best wishes of all who have known him."

WILSON'S PATENT RETORT-SETTING AND MODE OF MANUFACTURING CARBURETTED HYDROGEN GAS.

The annexed setting is the invention of, and has been patented by, Mr. A. F. Wilson, of 18, Buckingham Street, Adelphi. The system professes to effect—

1. A saving in labour by hoisting the coal at once to a sufficient elevation from which by gravitation and a slight propulsion it would descend into, and be pushed down the inclined bottom of, the retort.

2. An increased production and more equal quality of gas by reason of regularity of temperature, and the introduction at short intervals of small quantities of coal, instead of the present mode of heavy charging every six hours.

3. An improvement in the quality of coke from the gradual cooling of this substance in the coke chambers.

4. The production of steam from the heat imparted in the cooling of the coke, and from the waste products of the furnace combustion in their passage to the chimney.

5. The superheating and deoxidization of this steam in the horizontal retorts, by an arrangement similar to the passage of gas in purification through a purifier tray.

6. The combination of hydrogen so formed with the heavy hydrocarbon vapours of the coal gas, and their consequent partial or entire conversion into carburetted hydrogen gas.

7. The supply of heated air to the furnaces, the heat being obtained by radiation from the coke chambers, and the conduits for conveying it also forming ventilators for the ventilation of the passages underneath.

The retorts, E, are tapered, widening towards the under part, and are set alternately in an inclined and diagonal position to each other, resembling in the general form, when viewed from the front, the letter X, or a St. Andrew's cross, the angle being such that coke will not slide upon the bed without a slight propulsion.

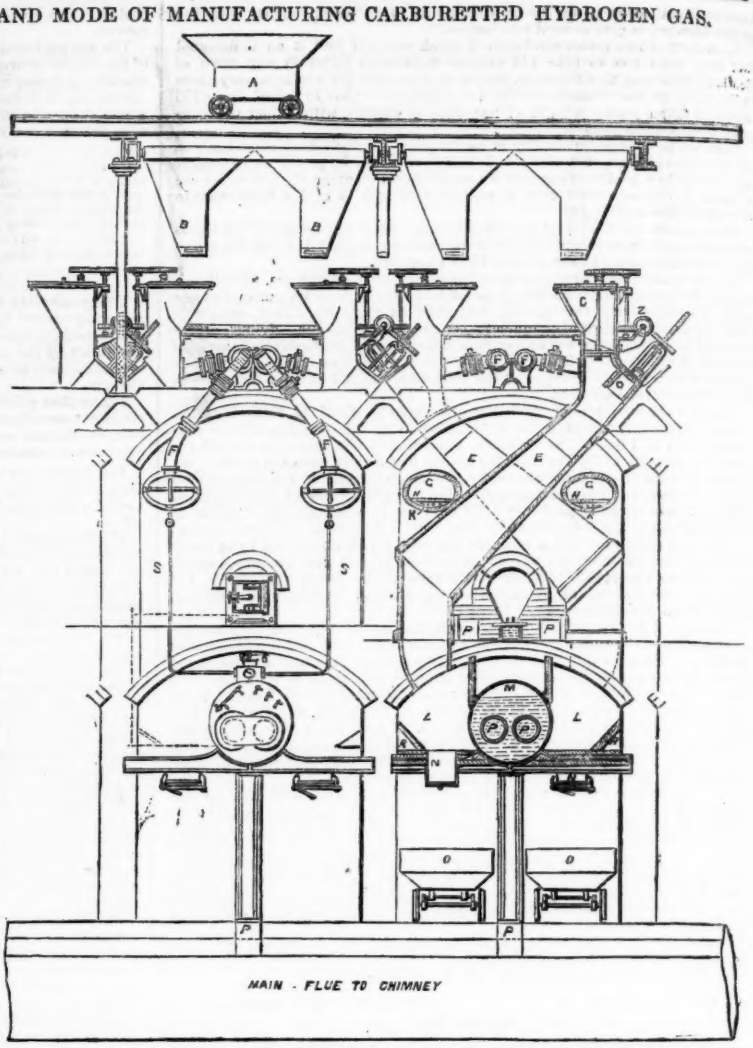
The operation begins by filling the retort with this substance, discharging by the bottom door what may have fallen into the coke chamber. Coal is then brought and dropped from trucks, A, having flap-bottom doors, into shoots, B, made of a convenient size to be easily moved, when full, transversely on the cross rails.

From these shoots, by sliding doors, the coal descends into hoppers, C, attached to the mouthpieces, and these being full, are secured by air-tight lids in the usual way.

These hoppers are provided with disc valves worked by spindles and gearing, and to the spindles may be attached agitators of a strong simple form, to obviate any tendency the coal might have to clog. A wide grating would be placed inside, under each lid, to prevent the admission of pieces of coal which might be too large to pass easily through the hole in the disc valve.

Everything being now ready, the gearing is set in motion—the coal descends into the retorts, and being pushed forward by the propeller, D, displaces a corresponding portion of coke, which falls into the coke chamber, and so on continuously, the coal, of course, becoming coke gradually, as it descends, and the gas passing off by the pipes, F, either through the horizontal retorts, G, or by an arrangement of valves, direct to the condensers.

The passage of the coal through the retort is calculated to occupy about three hours before carbonization is complete, and it is ready to drop into the coke chamber, L, and the coke might be allowed to accumulate in this chamber until, for want of more space, it had to be drawn off.



The chamber in this way becomes hot, and this heat is withdrawn in two ways, one being by means of a steam-boiler, M, the plates of which would, of course, remain at the temperature of the water within, and the other by radiation to the flue, R, which ventilates the vault, and conveys air to the furnace.

The formation of steam is also assisted by conveying through the internal tubes, P, the waste heat of the furnace on its way to the main flue of the chimney.

The steam, when formed, is conveyed to the horizontal retorts, and may then be passed through superheating pipes laid in the under segment, or an arrangement of perforated fire-clay blocks may be substituted for these pipes, the object being to bring the steam into contact with as large a heating surface as possible, composed of a material in itself not liable to oxidize.

After being thus superheated to the point of decomposition, the steam finds its way through the superincumbent deoxidizing material, laid on the grating, H, this material being either iron, coke, breeze, or other suitable agent; and having so passed, its free element, hydrogen, intermingles at this stage with the coal gas generated in the inclined retorts, and the united gases pass off in the usual manner to the other parts of the apparatus.

The furnace ash-pit is kept closed, either by a plate or door fitting tightly, and is only opened when it requires cleaning.

Such is a slight description of this apparatus, in which the patentee endeavours to take advantage, for the purpose of forming steam, and to assist the fuel account, of heat, which it is not too much to say is at present worse than wasted; and also by a special setting of retorts to supersede the present system of working, substituting the employment of machinery, aided by natural gravitation, for the laborious manual exertion now necessary; not the least advantageous part of the scheme being the maintenance of regular heats by means of light charges, and the total exclusion of air from the retorts in charging.

The machinery may be driven by hand, but a steam-engine would be preferable—the steam for this engine being obtained free of cost for fuel—and it could be easily applied to work a large bench, as, although the motion is reversing, this would scarcely be a difficulty. If worked by hand, one man would work over 80 retorts, driving the propellers of ten mouthpieces at one time.

The necessity of a hydraulic dip is obviated by having closed retorts, valves being introduced instead.

It is intended that a slight vacuum in working should be maintained; but in order to prevent any danger which might thus arise when the coke-discharging doors are opened, throttle-valves are introduced on the gas egress-pipes, F F, so that the man in charge of withdrawing the coke may, before opening the doors, regulate the pressure to anything which may be found necessary. At the same time it is not supposed that, from the momentary interval, the doors would be open, much danger in this way could be experienced.

A small door admits clearing-irons for stoppages in the retorts or the pipes, and the propeller gearing and main door can be easily removed at any time for scurfing or repair. The difficulties experienced in other machinery-worked settings are here to a great extent, if not entirely, obviated, as there is neither iron work exposed to the intense heat of the oven; nor is any special care necessary in the breakage of the coal, the grating on the hopper preventing the entrance of pieces likely to create a stoppage.

Lastly, although no doubt a setting of this kind will be more expensive than an ordinary one, the make of gas per area will also be greatly augmented, and probably there will be no excess of capital employed in the retort-house per 1000 cubic feet manufactured, as, if the coal is sufficiently carbonized in half the time at present occupied, this alone will double the quantity produced per retort, without counting anything for what is also relied on—increased production per ton.

METROPOLIS GAS SUPPLY.

Dr. Stevenson's report of the quality of the gas supplied in St. Pancras during the month of March states that the maximum illuminating power of the gas supplied at the testing-station by the Imperial Company during the month of March was 15·0, the minimum 14·0, and the average 14·4 standard sperm candles. The illuminating power was a trifle less than during the preceding month. Of impurities, ammonia was always detected in small quantity, whilst sulphuretted hydrogen was invariably absent. Sulphur was present to the extent of 24·20 grains per 100 cubic feet.

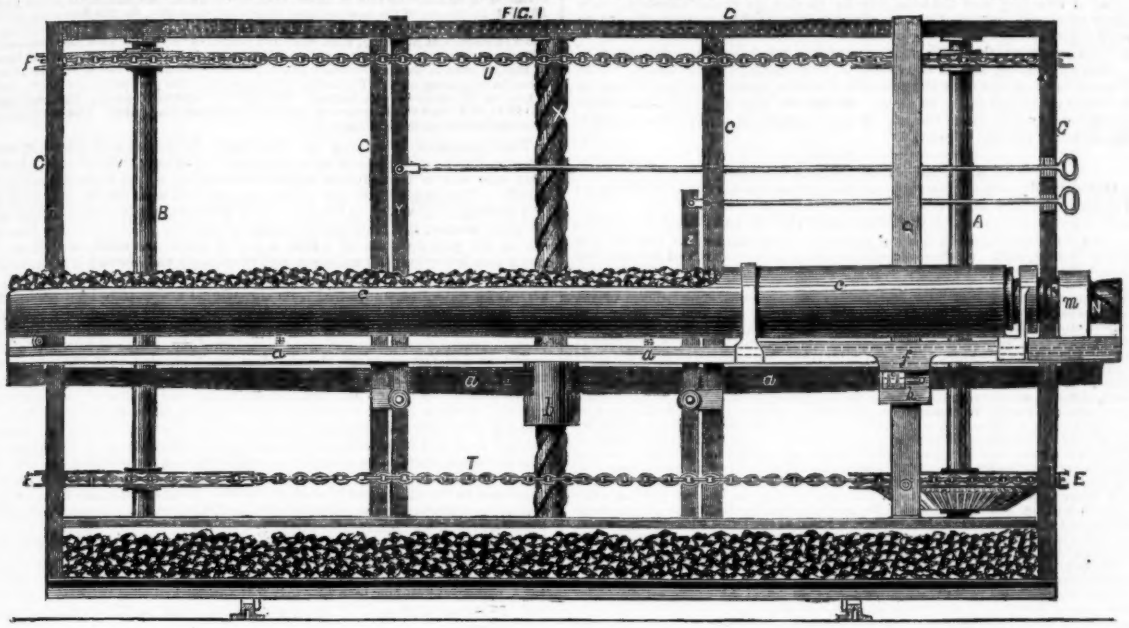
St. George, Hanover Square.—At the meeting of the vestry on Thursday last, Mr. Barlow moved—"That this vestry, with much regret, hears that the Gas Revision Commission has sanctioned an increase in the price of gas; and do ask the other vestries and district boards in the metropolis to confer with this vestry upon the question of the promotion of a bill in Parliament for empowering the Metropolitan Board of Works or other local authorities to purchase the whole of the interest of the different metropolitan gas companies. That a copy of this resolution be sent to the several vestries and district boards in the metropolis, and they be desired to appoint delegates to attend the proposed conference." Mr. Leslie asked the vestry to pause, and not fetter itself by adopting the motion. There was now a chance of the House of Commons dealing with the question. The motion was withdrawn.

Hackney.—At the meeting of the District Board of Works, on the 27th ult., the clerk read a letter from the Imperial Gas Company, giving the board formal notice of the result of their application for power to increase the price of gas, and intimating that the charge for lighting the public lamps in this district during the ensuing 12 months would be £5 18s. each, instead of £4 11s., as previously. The clerk also read a letter from the Paddington Vestry, enclosing a copy of the resolution adopted by that body, calling upon the vestries and district boards to unite in urging upon the Metropolitan Board of Works the advisability of introducing a bill into Parliament, with a view to obtaining powers to buy up the various gas companies in the metropolis. The surveyor stated that there were about 2000 street-lamps in the district. Mr. Leeson did not see why the supply of gas and water should not be undertaken by representatives in London, as is the case in some of the large provincial towns. The profits then would go towards diminishing the rates. Mr. Beck said it would be for the Metropolitan Board of Works to consider whether it would not be advisable to establish new factories rather than buy up the existing monopolies. After some further discussion, it was eventually resolved that the thanks of the board be sent to the Paddington Vestry, with an intimation that the entire subject would be taken into consideration at an early date.

Romford Gas Company.—A Board of Trade inquiry has just been held at Romford, on the application of the gas company in that town, for a Provisional Order. We hope to find space for a report of the proceedings next week.

RICHARDS'S IMPROVEMENTS IN APPARATUS FOR CHARGING AND DRAWING RETORTS.

FIG. 1



The annexed engravings illustrate certain improvements in machinery and apparatus for charging and drawing retorts used in the manufacture of gas, which have recently been patented by Mr. William Richards, of Burton Road, Brixton.

This machine is constructed with a quadrilateral frame, having a platform for the purpose of carrying coals for supplying retorts. The machine, with coals, runs on rails in the retort-house, and the power necessary, either for drawing or charging retorts, or for propelling the machine, is obtained from an engine. To render the apparatus the more intelligible, only those parts possessing novelty are shown in the drawings. The toothed wheels, *o* and T (fig. 2), receive their motion from the engine, as can be well understood, and by these the machine is set in action.

Fig. 1 is a side view with the scoop filled, and in the act of rising to upper tier of retorts.

Fig 2 shows the opposite side of machine, with a modification for actuating the rakes, adapted for works of limited capacity, the machine as described being intended for the double purpose of charging and drawing.

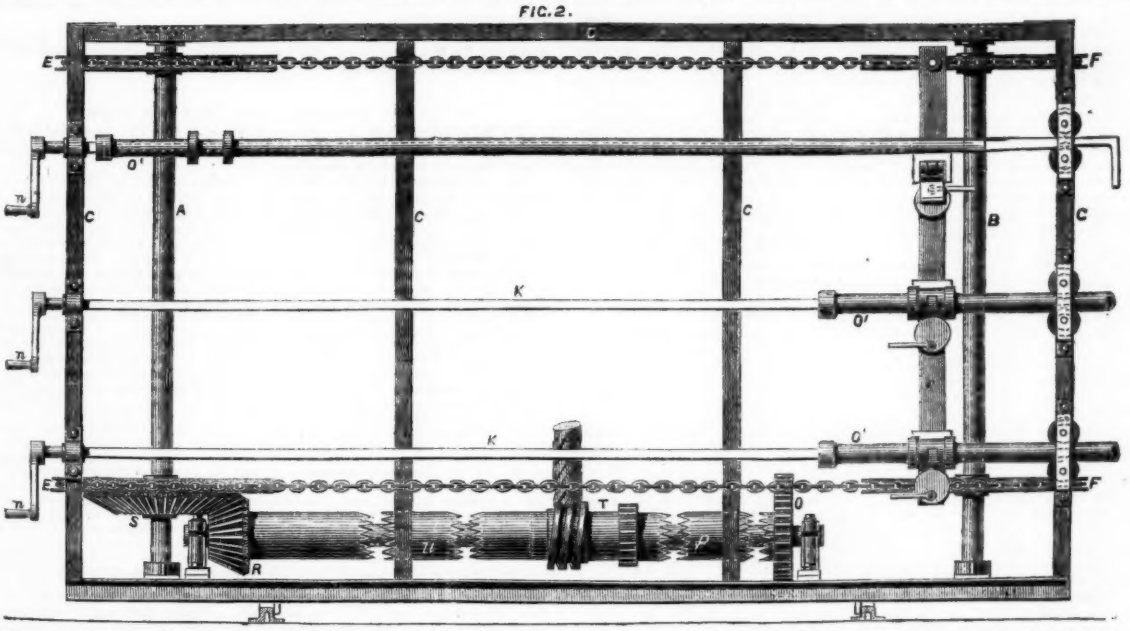
Within the frame, C C C, are two vertical axles, A and B, revolving on suitable bearings, and on these axles are fixed the horizontal chain pulleys, E, E and F, F. Two endless chains, T and U, pass over their corresponding pulleys, and are so arranged that they cannot slip, and to these chains are attached the vertical bars, G (fig. 1) and *r* (fig. 2).

The chain pulleys are driven by the bevel pinion, R, working into horizontal wheel, S, and by causing the clutch-box, *p* (fig. 2), to gear with either one or the other of its corresponding clutches, by means of the lever, *y*, the chain pulleys are made to rotate, first in one direction and then in the other, so giving to the chains and the vertical bars, *g* and *r*, the necessary motion for charging and drawing the retorts.

The scoop, C, is raised and lowered to the desired elevation by the vertical screw, X, working into boss, *b*, which boss forms a part of the horizontal frame, *a a*, continued to front of machine, *a' a'*. This frame rises or descends, according to the motion of the screw, X, whether that motion be to the right or to the left. The screw is actuated by a worm gearing into a toothed wheel fixed on its base.

On the horizontal frame, *a' a'*, glides freely the poppet, *f*, carrying the scoop, which turns with facility in the poppet. Another poppet, *m*, also glides on frame, *a' a'*, until the scoop is near the end of retort, when it is prevented from further advancing by a stop, and the forward motion acting on the screw, *m*,

FIG. 2.



causes the scoop to turn over and discharge its contents on to the bottom of the retort, and on returning by the same action the scoop is turned so as to be again in a position to be filled with coals.

The toothed wheels, *o* and T, the worm actuating the vertical screw, the bevel pinion, R, with their corresponding collars and clutches, all run loose on the main shaft, and are only brought into action by their corresponding clutches, when gearing with the clutch-boxes, *u* and *p*.

The driving power is communicated *direct* to the toothed wheel, *o* (fig. 2), and *indirectly* to wheel, T, by means of an intermediate wheel, so that when the driving power gears with *o* the motion of the main shaft will be in one direction, and when it gears with T it will be in the opposite direction. By these means the action is reversed without stopping the engine.

For the purpose of directing the action either to the right or to the left, whether for raising or lowering the scoop, or for advancing it into, or withdrawing it from the retort, or for giving the to-and-fro motion to the rakes, it is only necessary that the clutch-box, *p*, should be put in gear with one or the other of its clutches, by means of the lever, *y*.

In order to bring the screw, X, into action, either for raising or lowering the scoop, the clutch-box, U, is geared with clutch attached to worm; and to bring the chains into action, either for propelling scoop or rakes, the clutch-box, U, is geared with clutch attached to bevel wheel.

Thus, by the machine described, the scoop being filled with coal, is first raised to the desired elevation, pushed forward into the retort, turned over, and its contents discharged; it is then withdrawn and turned over, and descends ready to be again filled with coal, all these actions being accomplished simply by moving the levers, *y* and *z*.

Fig. 2 shows an arrangement for actuating the rakes, suitable for a small works. The hinge-piece, *h* (fig. 1), being detached from poppet, *f*, that side will be out of action. The vertical bar, *r* (fig. 2), has three clip joints, to which one or all of the rakes may be attached; but, as shown in the drawing, only two are at work, these being at the extreme end of retort.

The rakes are hollow the greater portion of their length, as shown by dotted lines on top rake, and at the end is a square hole, into which passes a square bar, K, provided with a shoulder working in bearings and controlled by the handle, *n*, the bar, K, serving as a key, so that by the handle, *n*, the position of the rake can be altered in order to withdraw all the coke from the retort.

In large works it is intended to have two sets of driving pulleys (of much smaller diameter than those described), with corresponding chains for each

machine, the engine and boiler being situated between them, when the operations of charging and drawing can be carried on simultaneously. The rakes may be of any suitable form, attached to vertical bar, so that all of them can work together.

The form given to the teeth of the clutches possesses the advantages of instant communication, and, in the event of any extraordinary strain, which would result in breakage with the common clutches, those described slip out of gear before any damage could be done. Means are also provided that whenever the scoop or rakes get to the end of their course or stroke, the communicating clutch is put out of gear.

CORK CONSUMERS GAS COMPANY.

The Ordinary Meeting of Shareholders was held at the Company's Offices, on the 27th ult.—Mr. T. MAHONY in the chair.

The directors report, read by the SECRETARY (Mr. D. Lane), was as follows:

Gentlemen,—Annexed you will find the accounts of the company for the half year ending in December, 1873. By them you will perceive that the cost of coal has exceeded that incurred in any previous half year of your business. On the other hand it is satisfactory to find that your gas-rental from private consumers shows an increase, and that the returns from residual products show an improvement. The balance of the revenue account amounts to £3683 15s. 3d., and when from this sum the amount of interest and other charges is deducted, the balance of the profit and loss account stands at £2502 13s. 6d. During the whole of the half year ending at Christmas the price of coal remained exceptionally high. Even at the present time the price of good gas coals at the ports of shipment is considerably over 100 per cent. in advance of the rates which prevailed for 20 years previously. The exceptionally mild winter diminished our sale of coke, and, although we reduced the price in the beginning of this year, we have still a very heavy stock on hand. In consequence of delays in the execution of works, we were not able, except to a small extent, to derive the benefit of the new apparatus which we recently erected. The whole of these works were, however, brought into operation at midwinter, when they were all urgently needed, and our experience of them now fully confirms the anticipation that the adoption of these extensions would result in an economy of manufacture. The new purifying apparatus will reduce the cost both of materials and labour, and the manufacture of sulphate of ammonia is now yielding a fair profit, which we trust will be increased. We have paid much attention to the examination and testing of mains and services, and the renewal of the latter wherever necessary. We are still engaged in these operations, and have adopted some recent improvements in the mode of laying service-pipes, which must increase their durability and staunchness. We have already felt the beneficial result of these operations, as the amount of unaccounted-for gas is sensibly diminished, and by perseverance in the same system we anticipate bringing this cause of loss down to the minimum which is possible under the conditions of distribution in the district. You are doubtless aware that since your last meeting we have applied to the Board of Trade for a revision of prices, rendered necessary by the state of the coal market, to enable us to carry on our trade as usual, and they have sanctioned an advance of sixpence per 1000 feet on the maximum prices fixed by our Act of Parliament, limiting us to dividends of 5 per cent. so long as we avail ourselves of the powers conferred by their order. We cannot help again reverting to the gross want of equity which, under such circumstances, limits the dividend of provincial gas companies to 5 per cent., while it enables the monster London companies to raise their prices, so as to secure them dividends of 10 per cent. In fact, within the past week authority has been given to the Imperial Company of London to advance their price 11d. per 1000, in order to put them in funds to pay a 10 per cent. dividend, and to fill up their reserve-fund to the maximum. The three years contract for public lighting with the corporation having expired at the close of 1873, we have entered into a new agreement for a similar period from that date for 4s. 9d. per 1000 cubic feet, instead of 3s. 9d., the price received under the former arrangement. At your last meeting the circumstances of the company were such that the directors did not look for any remuneration. We have now, however, set aside in the revenue account a reserve of £350—the amount usually voted for the annual fees. As intimated in our last report, we recommend that a dividend at the rate of 6 per cent. per annum, free of income tax, be declared for the half year. This will require about £3732. The balance of the profit and loss account being £2502, it will be necessary to take £1230 from the reserve-fund in order to pay this dividend.

The CHAIRMAN, in moving the adoption of the report, referred to the Board of Trade inquiry on the application of the company to raise the price of gas, and to the efforts which had since been made to remedy the only defect in the company's working brought forward during the investigation—viz., the unaccounted-for gas. For the past nine months they had devoted great attention to the testing of mains and services, and in relaying the latter whenever they had been found defective. In all cases of laying new services they embedded them in a layer of well-boiled tar mixed with ashes. The carrying out of this work of examination had been attended with a great deal of expense, but he believed it would yield a good return on the outlay. At the last general meeting it was decided to make a full and searching test as to the value or otherwise to the company of the patent process of Messrs. Lane and Still; and Mr. Anderson was requested to carry out the experiment, and make a report thereon as soon as the consumption of gas in the city was lessened, so that this trial would not interfere with the public supply. The directors had instructed the manager on the works to make the necessary arrangements for this purpose. The result would be submitted at the first subsequent meeting. Since the report was in type they had received intimation that their application for a reduction in the valuation of the works had been successful. This would save them a considerable sum, but the valuation was still too high.

Mr. LAMBERTE seconded the motion.

After a variety of questions had been asked and answered,

Mr. G. ANDERSON, consulting engineer to the company, addressed the meeting. He said the reason why Mr. Lane's process had not yet been tried was this—the new stores which had been erected, and which they had intended to use for the purpose of testing the process, were required for the work in the spring of the year; and the testing should be deferred until they could have a small manufacture, which would enable him to see the whole process performed in one building, so that he could inquire into it thoroughly, and then present the result to the company as it appeared to his mind. As to the company's debts, capital, and debentures, he thought the directors had acted prudently, and with consideration for the consumers as well as the shareholders, in preferring to borrow money at 5 per cent., instead of calling up more capital and paying 8 per cent. upon it. He was happy to say that they were doing better now than they were last year, and that they had passed the crisis. The testing of Mr. Lane's process, he added, would not involve expense, as they had the necessary apparatus already on the works, and he would be happy to report on the result of the trial as soon as possible.

Mr. ALCOCK asked what would be the expense of the improvements.

Mr. ANDERSON said he thought the expense would be about £1100 or £1200. There was a strong desire to have a station-meter erected at the works, which would cost £500 or £600 more. If they erected that, the whole expenditure would be under £2000.

The report and statement of accounts were then adopted.

Mr. ALCOCK moved that a dividend for the half year be declared at the rate of 6 per cent. per annum, free of income-tax, payable on the 7th of April next.

Mr. M'MAHON seconded the motion, and it was agreed to.

A cordial vote of thanks was then given to the chairman, to whom, it was acknowledged, the company was deeply indebted for the attention and ability he devoted to its affairs, and the meeting then separated.

BRISTOL WATER-WORKS COMPANY.

The Twenty-Eighth Annual Meeting was held on the 28th ult.—Mr. FRANCIS FRY, deputy-chairman of the board of directors, presiding.

The SECRETARY (Mr. A. J. Alexander) read the directors report, as follows:—

The revenue from water-rates for the year 1873 was £46,941 10s. 8d., being an increase of £1820 9s. 7d. over that of the previous year. The sum shown by the revenue account annexed to be now applicable for dividend is £11,601 4s. 11d., and the directors recommend that a dividend of 5 per cent. on the old and new original shares be now declared, This, with the intermediate payment of 5 per cent. already made, will make the whole dividend to be after the rate of 10 per cent. per annum. An additional share capital of £31,324 in respect of the new ordinary shares becomes now, for the first time, entitled to dividend; and during the past year there has been a large increase of charge upon income in respect of pumping, coal, rates and taxes, as compared with the previous year. The directors have, therefore, applied a sum from the reserve-fund, arising from premiums on some of the new ordinary shares issued by them, in relief of a pressure in some respects only temporary. The ordinary trade during the past years has been, and continues to be, entirely satisfactory. The capital expended during the past year was £8140 4s. 11d., and the length of mains laid was about four miles. The engineer reports that the works are in good condition.

The CHAIRMAN, in moving the adoption of the report and accounts, said the revenue for the year showed an increase of £2200 over that of 1872; but from that sum was to be deducted £400 for sundries, which made the net increase £1820. The expenditure on capital account had been chiefly for laying pipes and sinking a new well at Chelvey, from which they expected a further supply of water to meet the increased demands of the city. The directors had issued during the year upwards of £4000 worth of debenture stock, and there was a small amount remaining unissued, and they could recommend it with confidence to the shareholders if they wanted a secure investment for their capital. The arrears of water-rates appeared from the printed accounts to be £6462, but they had already collected £5300 of that sum, leaving only £1100 outstanding, and the directors thought this was a very fair state of the collection. During the present year the company had already laid on £500, which the directors thought would be satisfactory to the shareholders, as it showed that they were maintaining their usual rate of increase, £2000 per annum. The speaker next referred to the illness of Mr. Bell, the engineer, and spoke of the faithful and valuable services he had rendered to the company since its establishment. He alluded to the increased amount of the expenditure necessitated by the augmented price of coal, and congratulated the shareholders that the price was going down. The directors intended to submit a resolution giving an increase of salary to the secretary of £100 per annum. It was now five years since Mr. Alexander was appointed to the office, and he had given very great satisfaction by his zeal and ability in attending to the officers of the company, and the directors thought the time had come for raising his salary.

Mr. C. J. THOMAS seconded the resolution, which was carried unanimously.

The CHAIRMAN proposed that a dividend on the old and new original shares be declared at the rate of 5 per cent. per annum for the half year ending Dec. 31, 1873, to be paid on the 15th of April. He remarked that the dividend declared was far beyond that paid by many companies, being at the rate of 10 per cent. per annum.

Mr. J. WETHERMAN seconded the proposition, and it was agreed to.

The CHAIRMAN next moved that the secretary's salary be raised to £500 per annum.

Mr. C. J. THOMAS seconded the motion with great pleasure, and it was carried *nem. dis.*

Mr. ALEXANDER, in returning thanks, said during the five years he had had the pleasure of serving the directors he had seen a very large increase in the business of the company, and a corresponding increase in the dividends, and the field for further improvement seemed to be unlimited. In some of the districts which had been longest supplied by the company there were still a number of houses and premises which did not take the company's water, and besides the localities in which the mains had been recently laid on, there were districts to which the company's system had not been extended, and where a large increase of revenue might be gradually earned. He assured the proprietors that his best services would continue to be given to the interests of the company.

On the proposition of the CHAIRMAN, seconded by Mr. G. WILLS, the retiring directors—Messrs. R. Fuidge, J. Leech, W. Sanders, and S. Jones—were re-elected.

Mr. R. FUIDGE briefly returned thanks on behalf of himself and colleagues.

On the motion of Mr. BALE, seconded by Mr. MAYNARD, Mr. H. Grace was re-appointed auditor.

A vote of thanks was passed to the directors on the motion of Mr. ADLAM, seconded by Mr. BELFIELD; and the proceedings terminated with the usual compliment to the chairman.

THE GASLIGHT AND COKE COMPANY.

The Half-Yearly Ordinary General Meeting of this Company was held at the Offices, Horseferry Road, Westminster, on Thursday, April 2—SIMON ADAMS BECK, Esq., the Governor, presiding.

The SECRETARY (Mr. J. O. Phillips) having read the advertisement convening the meeting, the corporate seal was affixed to the register of shareholders, and the minutes of the last general meeting read and approved.

The following report and statements of account were taken as read:—

The annexed statement of the accounts of the company for the half year ending the 31st of December last, which the directors have now the honour to submit to the proprietors, shows that the net proceeds of the six months trading amount to £140,886 5s. 11d., which, with the addition of the balance of £9834 0s. 7d. carried from the Midsummer account, enables them, after providing for interest and dividends on borrowed money and preference shares, to declare a dividend for the half year on the ordinary shares at the rate of 10 per cent. per annum. This result, notwithstanding the increase in the price of gas awarded by the Board of Trade in April last, has not been attained without the exercise of the utmost diligence and care in management on the part of the directors, who, in consequence of the insufficiency of that award, have found themselves unable to make any increase to the company's statutory insurance-fund.

The directors have to report that, at the close of the last autumn, they succeeded in completing, at a reduced price, a contract for the balance of their requirements of coal for the current year; and they have now the pleasure to add that the present various indications of a falling market lead them to hope that the coal which they will require for use in the next year will be contracted for at a further and material reduction in price. In the meanwhile, however, to meet the excessive charges under which the company is labouring, in the cost not only of coal, but also of iron, timber, bricks, lime, and every other material used in and about the manufacture of gas, as well as the high rates of pay for all classes of labour which have now become established, the directors have (as indicated in their last report) made a second application to the Board of Trade, by whom commissioners have been appointed, who are now engaged in investigating the accounts and operations of the company, with a view to ascertain what additional increase in the price of gas shall be fixed for the present year. The directors will press upon the commissioners the absolute necessity for fixing, on this occasion, a price sufficient to redeem all the pledges given to the company by an Act in other respects so onerous as the City of London Gas Act, 1868; and they are sanguine that the decision of the commissioners, who have the experience of the past year to guide them, will be incomplete accord with the conditions of the Act.

It was expected that the sale of coke, which for a short period at the close of last year realized an unusually high price, would go far to alleviate the pressure on the company's resources caused by the great cost of coal; but a strong and sudden reaction has disappointed any such expectation, and the directors, like those of every other gas company in London, find themselves in a position of difficulty with regard to the disposal of this product at a remunerative rate.

The extension of the Beckton works, which has been so long postponed, and additions to the Bow and Kensal Green stations, having now become matters of imperative necessity, the directors have entered into contracts of an extensive nature to meet the demands of the next winter. It is gratifying to announce that these contracts are of a more moderate and satisfactory character than was anticipated, and that, on the completion of the works to which they relate, the directors will, in all probability, be enabled to throw permanently out of action not only the Blackfriars but also the Westminster station.

The directors are happy to be able to state that their exertions to effect a reduction in the per centage of gas hitherto unaccounted for have already been attended with marked success; and they are of opinion that the course which they are now pursuing throughout the whole of their districts will tend to its further very considerable diminution, and, as a consequence, to the realization of an increased profit.

The warrants for the dividends on all classes of shares will, according to usual custom, be transmitted to the proprietors, by post, fourteen days after the day of meeting.

No. 1.—STATEMENT OF SHARE CAPITAL, *on Dec.* 31, 1873.

Acts of Parliament regulating the Capital of the Company.	Description of Shares.	Maximum Dividend authorized.	Number of Shares issued.	Nominal Amount of Shares.	Called up per Share.	Total paid up.	Amount not paid up or unissued.	Total Amount authorized.
The Gaslight and Coke Company's Act, 1868	Ordinary A.	10 per cent.	90,000	£10	£10	£900,000	..	£900,000
	Preference A.	5 per cent., with option of conversion.	25,000	10	10	250,000	..	250,000
			20,000	10	10	200,000	..	200,000
			20,000	10	10	199,826	£174	200,000
The Victoria Docks Gas Act, 1857	Ditto.	Ditto.	10,000	10	10	100,000	..	100,000
The City of London Gas Company's Act, 1859	Ordinary A.	10 per cent.	30,000	10	10	300,000	..	300,000
The Great Central Gas Consumers Act, 1851	Ditto B.	4 per cent.	10,000	10	10	100,000	..	100,000
The Equitable Gaslight Company's Act, 1842	Preference C.	10 per cent.	20,000	10	10	200,000	..	200,000
The Companies Act, 1862, as applied to the Western Gaslight Company, Limited	Ditto D.	10 per cent.	12,000	25	25	300,000	..	300,000
The Gaslight and Coke Company's Act, 1872	Ordinary A.	10 per cent.	60,000	10	10	599,978	22	600,000
	..	10 per cent.	..	..	..	..	1,000,000	1,000,000
						£3,149,804	£1,000,196	£4,150,000

No. 2.—STATEMENT OF LOAN CAPITAL, *on Dec.* 31, 1873.

Acts of Parliament regulating the Capital of the Company.	Debentures.					Total Amount borrowed.	Remaining to be borrowed.	Total Amount authorized.
	4 per Cent.	4½ per Cent.	4½ per Cent.	4¾ per Cent.	5 per Cent.			
The Gaslight and Coke Company's Act, 1868	..	..	£162,500	£300,000	..	£462,500	..	£462,500
The City of London Gas Company's Act, 1859	£1,000	£4,400	40,345	..	£14,255	60,000	..	60,000
The Great Central Gas Consumers Act, 1851	2,000	10,050	53,950	..	..	66,000	..	66,000
The Victoria Docks Gas Act, 1857	..	..	25,000	..	..	25,000	..	25,000
The Companies Act, 1862, as applied to the Western Gaslight Company, Limited	..	..	..	..	..	..	£200,000	200,000
The Gaslight and Coke Company's Act, 1872	..	..	..	..	..	..	250,000	250,000
	£3,000	£14,450	£281,795	£300,000	£14,255	£613,500	£450,000	£1,063,500

No. 3.—CAPITAL ACCOUNT, *for the Half Year ending Dec.* 31, 1873.

Dr. *Cr.*

	Expenditure from June 24, 1868, to June 30, 1873.	Expended this Half Year.	Total Expenditure to Dec. 31, 1873.
To Expenditure to June 24, 1868; also expenditure of Equitable Gas Company to June 30, 1871, and Western Gaslight Company to June 30, 1872	..	..	2,150,569 13 2
Since June 24, 1868—			
Lands acquired, inc. law charges	167,957 19 11	2,913 11 3	170,871 11 2
Buildings and machinery in extension of works	806,911 16 6	72,140 18 2	879,052 14 8
New mains and service-pipes	202,652 11 8	7,364 3 8	210,016 15 4
Meters (additional), includ. fixing	36,539 4 2	3,498 10 7	40,037 14 9
Parliamentary costs	9,859 7 6	..	9,859 7 6
Interest on capital raised for works at Beckton	41,117 5 1	..	41,117 5 1
	1,265,038 4 10	85,917 3 8	3,501,525 1 8
Cr.			
By Amount realized on sale of surplus lands		953 10 0	
Ditto ditto of disused plant		760 2 1	1,713 12 1
			3,499,811 9 7
Balance of capital account			263,492 10 5
			3,763,304 0 0

	Certified Receipts to June 30, 1873.	Received during Half Year.	Total Receipts to Dec. 31, 1873.
By Ordinary shares, of £10 each	1,720,000 0 0	79,978 0 0	1,799,978 0 0
B shares, of £10 each	100,000 0 0	..	100,000 0 0
C ditto, ditto	200,000 0 0	..	200,000 0 0
5 per ct. pref. shares, of £10 each	250,000 0 0	..	250,000 0 0
Ditto ditto, second issue	200,000 0 0	..	200,000 0 0
Ditto ditto, third ditto	179,954 0 0	40,094 0 0	299,826 0 0
Amount in advance of calls	79,778 0 0		
D shares, of £25 each	300,000 0 0	..	300,000 0 0
Debentures	613,500 0 0	..	613,500 0 0
	3,643,232 0 0	120,072 0 0	
Total			3,763,304 0 0

No. 4.—REVENUE ACCOUNT, *for the Half Year ending Dec.* 31, 1873.

Dr. *Cr.*

	£ s. d.	£ s. d.
To Manufacture of gas—		
Coals, including carriage, trimming, and dues, &c. (*see* Account No. 9)	304,039 15 0	
Purifying materials, water, &c.	8,105 3 2	
Salaries of superintendents and officers at works	3,932 14 8	
Wages at works (manufacture)	40,769 14 9	
Repair and maintenance of works and plant; less old material sold, £3094 4s. 2d.	39,296 8 2	
		396,143 15 9
Distribution of gas—		
Repair, maintenance, and renewal of mains and service-pipes	16,016 8 4	
Salaries of clerks in Light Office and inspectors	3,502 10 0	
Meters—repairing, renewing, and refixing	13,166 6 9	
		32,685 5 1
Public lamps—		
Lighting and repairing	..	6,470 0 6
Rents, rates, and taxes—		
Rents payable	3,790 8 0	
Rates and taxes	9,135 6 3	
		12,925 14 3
Management—		
Directors allowance	2,500 0 0	
Company's auditors	250 0 0	
Salaries of secretary and office clerks	2,229 3 4	
Collectors commission	4,162 9 6	
Stationery and printing	1,375 10 2	
General charges	709 17 6	
		11,227 0 6
Public officers—		
Company's proportion	586 8 10	
Public testing stations	234 1 8	
		820 10 6
General law charges	2,179 8 6	
Parliamentary charges	13 0 6	
		2,192 9 0
Depreciation-fund for works on leasehold lands	..	372 10 0
Superannuation allowances under amalgamation schemes, and annuities	..	6,939 2 8
Bad debts	..	1,673 18 2
		471,450 6 5
Balance carried to net revenue account		140,886 5 11
		£612,336 12 4

	£ s. d.	£ s. d.
By Sale of gas—		
Common gas (1,373,576,000 cubic feet), at 4s. 4d. per 1000	297,608 2 2	
Cannel gas (432,317,000 cubic feet), at 5s. 5d. per 1000	117,086 2 3	
Sold in bulk, 29,001,000 cubic feet, at 4s. 7d. per 1000	6,646 4 0	
Public lighting and under contracts	31,531 3 3	
		452,871 11 8
Rental of meters	..	5,150 0 0
Residual products—		
Coke (Account No. 10)	111,602 15 6	
Breeze	1,887 6 1	
Tar	18,801 19 1	
Ammoniacal liquor	18,857 17 9	
		151,149 18 5
Rents receivable	..	2,123 17 7
Transfer fees	..	75 1 0
Canteen account	..	149 14 4
Revision Commission, 1873, being excess of cost estimated in June over amount of accounts since rendered	..	816 9 4
		£612,336 12 4

No. 5.—NET REVENUE ACCOUNT, *for the Half Year ending Dec.* 31, 1873.

Dr. *Cr.*

	£ s. d.	£ s. d.
To Interest on debentures accrued to Dec. 31		£14,189 11 6
Dividend on B shares, at 4 per cent.	£2,000 0 0	
Ditto on C ditto, at 10 ditto	10,000 0 0	
Ditto on D ditto, at 10 ditto	15,000 0 0	
Ditto on preference shares, at 5 per cent.	17,500 7 8	
		44,500 7 8
		839 11 2
Interest on payments in anticipation of calls		2,500 0 0
Defalcation account (Great Central Gas Consumers Company)		148 9 0
Interest on temporary loans		
Balance of net revenue applicable to dividend on the ordinary stock		88,542 7 2
		£150,720 6 6

	£ s. d.	£ s. d.
By Balance of net revenue June 30, 1873		94,167 7 3
Less dividend declared for the half year ending that day		84,333 6 8
		£9,834 0 7
Revenue account		140,886 5 11
		£150,720 6 6

No. 6.—INSURANCE-FUND ACCOUNT, *for the Half Year ending Dec.* 31, 1873.

Dr.	£ s. d.		£ s. d.	*Cr.*
To Balance on Dec. 31, 1873	31,304 10 6	By Balance on June 30, 1873	30,818 7 3	
		Interest on amount invested	486 3 3	
	31,304 10 6		31,304 10 6	

No. 7.—DEPRECIATION-FUND ACCOUNT (for Works on Leasehold Lands), *for the Half Year ending Dec.* 31, 1873.

Dr.	£ s. d.		£ s. d.	*Cr.*
To Balance on Dec. 31, 1873	4,339 19 10	By Balance on June 30, 1873	3,929 14 1	
		Amount brought from revenue account	372 10 0	
		Interest on amount invested	37 15 9	
	4,339 19 10		4,339 19 10	

No. 8.—DEFALCATION ACCOUNT (Great Central Gas Consumers Company), *Dec.* 31, 1873.

Dr.	£ s. d.		£ s. d.	*Cr.*
To Balance on June 30, 1873	12,358 7 5	By Amount brought from net revenue account, for the half year to Dec. 31, 1873	2,500 0 0	
		Balance	9,858 7 5	
	12,358 7 5		12,358 7 5	

No. 9.—STATEMENT OF COALS USED, &c., *during the Half Year ending Dec.* 31, 1873.

Description of Coal.	In Store, June 30, 1873.	Received during Half Year.	Used during Half Year.	In Store, Dec. 31, 1873.
	Tons. cwt.	Tons. cwt.	Tons. cwt.	Tons. cwt.
Common	61,128 0	175,480 0	199,738 0	36,870 0
Cannel	27,886 0	29,990 0	36,115 0	21,761 0

No. 10.—STATEMENT OF RESIDUAL PRODUCTS *made and disposed of during the Half Year ending Dec.* 31, 1873.

	In Store, June 30, 1873.	Made during Half Year.	Used in Manufacture during Half Year.	Sold during Half Year.	In Store, Dec. 31, 1873.
Coke—					
Common—chaldrons	2,194	213,461	72,535	117,144	25,976
Cannel—ditto					
Breeze—ditto	4,740	18,031	60	17,299	5,412
Tar—gallons	213,276	2,284,717	..	2,155,873	342,120
Ammoniacal liquor—ditto	589,011	6,215,301	..	5,862,284	942,028

Dr. GENERAL BALANCE-SHEET *on Dec.* 31, 1873. *Cr.*

	£ s. d.		£ s. d.	£ s. d.
To Capital account—		By Cash at bankers	..	16,138 13 10
Balance at credit thereof (Account No. 3)	263,492 10 5	Ditto invested at interest	..	43,728 11 3
Net revenue account—				
Balance at credit thereof (Account No. 5)	88,542 7 2	Stores on hand, viz.:—		
Insurance-fund account—		Coals	..	84,125 13 9
Balance at credit thereof (Account No. 6)	31,304 10 6	Coke and breeze	..	22,492 4 1
Depreciation-fund (for works on leasehold lands)—		Tar and other products	..	5,542 15 0
Balance at credit thereof (Account No. 7)	4,339 19 10	Sundry stores	..	31,911 18 6
Unpaid dividends	6,998 6 5			
Preference dividends for amount due to Dec. 31, 1873	44,500 7 8	Outstanding accounts due to the company, viz.:—		
Debenture interest for amount due to Dec. 31, 1873	11,508 5 1	Light account—		
Interest on payments in anticipation of calls	839 11 2	Arrears uncollected	6,625 15 4	
Amount due for coals and to sundry tradesmen and others	72,503 9 7	Quarter ending Dec. 31 to be collected	315,871 10 8	
Benevolent-fund	1,404 6 6			322,497 6 0
Temporary loans	40,000 0 0	Coke and other products	31,820 8 8	
Gas-rental, for balance of account	13,456 0 0	Sundry accounts	1,391 15 10	
				33,212 4 6
		Retiring allowances	..	8,752 0 0
		Ship *Dispatch*	..	630 0 0
		Defalcation account (Great Central Gas Consumers Company)—		
		Balance at debit thereof (Account No. 8)	..	9,858 7 5
	578,889 14 4			578,889 14 4

I certify that the above accounts are correct, and that the balance of net revenue, for the half year ending Dec. 31, 1873, is £88,542 7s. 2d., and that such amount, subject to deduction for income-tax, is applicable to payment of dividend on the ordinary stock.

Jan. 31, 1874. (Signed) CHAS. H. PARKES, Official Auditor.

The GOVERNOR: Gentlemen, in rising to move the adoption of the report, there are but two or three points upon which I shall think it at all necessary to make a remark. The accounts are now so full, and the statements in the report place you so completely in possession of all the information which it is possible for us to furnish, that I am left with very little to say to you. There are, however, as I remarked, two or three points to which I may call your attention in making a comparison between the working of the last and the previous half year. I can only give you the results of an examination as between the half years ending in June and December, because the amalgamation of the Western Company with this company in the second half of 1872, which took place shortly before the strike in December of that year, interfered so with the accounts that no comparison can be drawn between it and the corresponding half of last year. Comparing the accounts for the December half with those of the June half of 1873, I may make a remark first with regard to the gas-rental. The illuminating power of the cannel gas was lowered on the 1st of July from 23 to 20 candles, and the price reduced from 6s. 3d. to 5s. 5d. This, together with a decreased consumption, has resulted in a loss of rental of £22,454. The coke has given £18,000 more; the net increase on all the residuals and sundries is £17,016, so that the net decrease in income amounts to £5438. Our coals cost us 2s. 3d. per ton more than in June, and, although the consumption has been less than in the first half year by 14,000 tons, the total charge under this head is more by £10,887. Wear and tear on works, and renewals of mains and meters, shows an increase of £21,244. You are aware that when we amalgamated other companies we had two or three different mains running through the same street; we have had to take these up and to renew the services. We hope, in this way, to get a large increase of income in consequence of the saving of waste, for, of course, where you have two mains to do the work of one the leakage is very considerably increased. Purifying and sundry charges have increased £3022, and these items together make a total increase of expenditure of £40,591. We, however, effected the following savings in last half year, as compared with the previous half year:—Manufactory wages, £5087; rent and taxes, £6866; management charges, £4387; revision and similar charges, £5258; strike and sundries, £5664; together, £27,162, leaving the net increased cost of manufacture £13,429, to which must be added £4866, as the increased charge for dividend, making our total increased charges £18,295. The net profit for the half year was £78,708. We required for dividend on ordinary stock £88,353, so that there was a deficit on the half year of £9625; but inasmuch as we had a balance over from the June half year of £9834, we are enabled to pay our dividends and to carry forward the large sum of £209. The commissioners, therefore, in raising our price last year, made it rather a close shave—in fact, but for the balance brought forward from 1872, it would have been too little. These, gentlemen, are the chief points to which I wish to direct your attention. I thought I should have had to communicate a piece of news to you, in reference to the award of the revision commissioners upon our late application; but I find, though the comissioners only made it last night, it is in all the papers this morning. We had, as you know, to go again for a revision this year, and we shall, unfortunately, have to go every year, as we cannot change the price of gas even a penny per 1000 without the sanction of the Board of Trade, and there is a constant agitation going on amongst the public on the subject. There is, however, this advantage, that we are bound to prove our case, and to show that we have exercised "due care and management." We believe we have done so, and the result of the inquiry is that we are authorized to increase the price of common coal gas for this year from 3s. 9d. to 5s., and cannel gas from 5s. to 6s. 3d. I trust, therefore, that, with continued "due care and management," we shall be able to pay you 10 per cent. for the next half year. And I think, also—but I never like to speak with confidence on anything of the sort, for after all it is only an opinion, and therefore I will say I hope that, by the fall in the cost of coal we shall be enabled to reduce the price. But mind, it is impossible to judge, in the present day, whether we can do that or not. All I can say with assurance is, that no care or looking after the concern shall be wanting on our part to enable us to attain that result.

The DEPUTY-GOVERNOR (the Hon. R. H. Browne) seconded the motion.

Mr. DOANE asked what would be the aggregate cost of the proposed extension of the Beckton works, and of the additions to the Bow and Kensal Green stations.

The GOVERNOR said the directors had intimated their intention to raise £200,000 for the works now going on, and of that sum they had raised among the shareholders £170,000 at 4½ per cent. They had not gone outside for any portion of the money.

Mr. DOANE asked whether the £200,000 would cover the whole outlay.

The GOVERNOR said probably it would, but it was impossible to tell exactly. After the first contract was made, the board went into the thing very closely, and determined to do a great deal of work with their own people. They sub-

let it to small men, and made a great saving thereby. They were erecting two new retort-houses at Beckton, with all the works necessary for the manufacture of gas to the extent of 5 million cubic feet more a day.

Mr. DOANE wished for some further information. He understood that on the 1st of July next the quality of the gas supplied in the Western Company's district was to be changed. There was only one set of mains in that district, as the company only supplied cannel gas. For the future common coal gas only would be supplied there. Was it likely that after the change any consumers in the district would call upon the company for a supply of cannel gas?

The GOVERNOR replied in the negative. This question of the change in the quality of gas had been well considered by the board. The vestry of Kensington, and the consumers in that district, made so strong a point about the extra charge for cannel gas, that upon their request alone the change to common gas was about to be made. The company sent to the Metropolitan Board of Works to know whether they would approve of it, because they did not want the board to turn round and complain of the step being taken. It was in consequence of the pressure put upon them by the consumers that it had been determined to make the change, and the company were now increasing the size of their mains wherever necessary to meet the increased demand; but there was only one set of mains.

Mr. JACKSON said he wished to know whether, amongst the contemplated works at Beckton, it was intended to erect more gasholders.

The GOVERNOR said it was, and the directors had now made contracts for four. Two of these were progressing very rapidly, and the contracts for two others had been sealed that day.

Mr. JACKSON wished to make a remark, because unquestionably the works at Beckton were the most splendid in the world. He did not presume to offer any advice to the board, not being an expert; but having spent a day in going over those works, to his inexperienced mind the colossal dimensions of the gasholders there was a matter of astonishment and alarm. Each of them occupied an acre of ground, and held a million cubic feet of gas. They were erected close together, and very near to the residences of the staff. He did not wish to excite any apprehensions in the minds of the shareholders—it would be absurd to do so, when perhaps there was no just cause—but he could not help thinking that this was a very serious matter. He had no doubt it had been well considered by the board, but he should like them to satisfy the meeting that these gasholders involved no risk of the public safety.

The GOVERNOR: In what way?

Mr. JACKSON said, in the way of explosions. Probably the idea of an explosion would be laughed at, and it might be said, "You cannot explode a gasholder." He did not believe the statement. He had been at the works, and wished other shareholders would go and judge for themselves. These gasholders were supported by columns of enormous size; but just imagine the enormous pressure which must be exercised by them. The name of the governor of the company was associated with one of the greatest mechanical triumphs of the day, and he (Mr. Jackson) hoped his attention would be directed to the matter. He had spoken to the eminent engineer who designed and planned these works, and asked whether it would make any difference in the distribution of gas if each of these large holders was divided into four. In reply, he was told that if the works were otherwise capable of furnishing the necessary supply, it would not be of any consequence. It must be remembered that a mixture of three times the quantity of atmospheric air with gas formed a most explosive mixture, and if an explosion did happen at Beckton, the result would be chaos, and not only London, but all the world would hear of it. The company possessed such extensive ground at Beckton that the gasholders might be erected further apart. Their existence near inhabited houses was a permanent menace. It was very possible the Board of Trade would hear of this, and therefore he thought it would be well that the matter should receive the attention of the directors before increasing these colossal works.

The GOVERNOR, in reply, said he would relate an anecdote in reference to the company many years ago. Sir William Congreve, the Government engineer of the day, came to the adjoining yard to inspect the works, being under the idea that the gasholders were very dangerous, because of the quantity they held. He was accompanied by several members of Parliament, and he said that no gasholder should contain more than 10,000 cubic feet. The company's engineer, the late Mr. George Lowe, got a red-hot iron, and immediately ran it into one of the gasholders to show that there was no danger of explosion. He (the governor) did not mean to say that gas was not explosive, but that, if the slightest care was taken, there was no danger to be apprehended. When the gasholders at Beckton were first built, one of them, owing to bad workmanship, did break down when it was full of gas; and, of course, there was a considerable amount of damage done, but there was no explosion. He might add that the Government which the honourable proprietor supposed would call the company to account had their powder magazine immediately opposite the Beckton works, and the company's engineer lived between the gasholders and the powder magazine. Instead of the gasholder power of the company being excessive, he thought it was not yet sufficient. All engineers considered that the gas storeage should be equal to a day's consumption, and the company had not that power at present. If they could have given the citizens of London double and treble the quantity of gas they had recently supplied, it would have been all taken, and the company would have had the increased profit.

Mr. STOKES said there had recently been some remarkable tides in the river, and he should like to know whether the company's works had been proof against them; if not, whether anything could be devised to secure them for the future.

The GOVERNOR said there had been no damage done by the tides; there were 9 inches of space above the level to spare.

A SHAREHOLDER asked how the expense attending the revision of price from year to year was to be borne.

The GOVERNOR said in 1873 the cost of the revision was £4000, and this year it would be about the same. Under the Act of Parliament, the commissioners had to allow for these expenses in the price they fixed for gas, so that, after all, the public had to pay them.

The motion for the adoption of the report was put, and carried unanimously.

On the motion of the GOVERNOR, a resolution affirming the minutes of the court of directors for payment of the dividend recommended in the report was then adopted.

On the motion of Mr. WOLLASTON, seconded by Mr. YOULE, the retiring directors, Mr. Beck (the governor), the Hon. R. H. Browne (deputy-governor), Mr. Adair, Mr. Adams, Mr. Bovill, Sir T. Gabriel, and Lieut.-Col. Makins, M.P., were re-elected, and the two former returned thanks for themselves and colleagues.

The GOVERNOR said he had to report that Mr. J. T. Hadland, formerly an auditor of the City Company, and Mr. Ford, formerly an auditor of the Western Company, who had acted in a similar capacity for this company since the respective amalgamations, did not intend to offer themselves for re-election. The court of directors had voted to each of these gentlemen a gratuity of £100. in pursuance of the 31st section of the scheme of amalgamation, on their retirement. He moved that the vote be affirmed.

The motion was put and carried. The other retiring auditors, Messrs. J. S. Barker, H. H. Chisholm, and T. J. Briggs, were re-elected.

A cordial vote of thanks was then given to the directors, and the proceedings terminated.

PROPOSED PURCHASE OF THE TUNBRIDGE WELLS GAS-WORKS BY THE TOWN.

At the usual Monthly Meeting of the Tunbridge Wells Improvement Commissioners—the Hon. F. G. MOLYNEUX presiding—on Wednesday last, the question of the proposed purchase of the gas-works by the town came on for discussion, the Gas Bill Committee having brought up the following report:—

The committee appointed to consider the gas bill have to report that, in consequence of the company's refusal to negotiate for the sale of their business to the town, or to amend their bill (except in some matters of comparatively minor importance), it has become necessary to oppose the measure in Parliament, and instructions have accordingly been given to have a petition prepared and presented on the part of the board. The main objects of this petition will be to oppose that part of the company's scheme, by which it is intended to remove their gas-works to the neighbourhood of the High Rocks, and to obtain the requisite powers to purchase the gas property. The committee have been advised that this latter object may be secured either by clauses to be introduced in the company's bill, or by giving an undertaking on behalf of the board to introduce a bill in the next session of Parliament, to place the gas business in the hands of the town on terms of perfect fairness to the gas shareholders. With regard to the first of these objects, the committee have the satisfaction of stating that in the opinion of an eminent gas engineer, whom they have consulted, the proposed site at the north of the town is quite as well adapted for gas-works as that near the High Rocks. As regards the proposed transfer of the business to the town—a proceeding which is now regarded with great favour by the Legislature—the committee are advised that the company are not likely to get their bill passed if the board give an undertaking to introduce a proper bill next year. They regret that the continued refusal of the company to treat with them renders this petition necessary, as it would have been far more agreeable to them to have arranged the transfer amicably without either party going to Parliament at all in the present session.

Mr. BROWELL, in proposing the adoption of this report, said that, when last he brought this matter under the consideration of the board, he stated that the gas company had resolved to reject all overtures for the sale of their property to the town, and that they seemed no less resolved to go to Parliament for powers to enable them to move the gas-works from their present site to the neighbourhood of the High Rocks. Since he made that statement, they had had an answer from the gas company to the various other objections which the board made to the bill as introduced into Parliament, and one of the letters he would read. It was as follows:—

Gas Company's Office, Tunbridge Wells, March 12, 1874.

Sir,—In reply to your communication of the 5th inst., my directors, while differing from the Gas Bill Committee as to the reasonableness of an offer which could only be barren of result under existing conditions both to the local board and the gas company, have instructed me to forward you the subjoined:—Although the Gas Bill Committee rightly assume that the object of the company in the adoption of the proposed site will ultimately lead to the removal of the gas-works, the directors do not consider they should be compelled by any such clause as the committee suggest, but must exercise their own discretion in the interests of their consumers and proprietary. No works for the manufacture of gas elsewhere, within the limits of the local Act district, could possibly be erected without the sanction of Parliament having been previously obtained, and any restrictive clause would therefore be not only unnecessary but superfluous. The extension of radius and capital may be taken together. The company, as a trading body, necessarily does not undertake any extension of lighting beyond the local Act district without a sure prospect of an adequate return in any case. The past history of the company shows that its progress has been developed cautiously and that no unnecessary expenditure of capital has ever taken place; therefore, although the additional amount now applied for may appear to the committee a large one, the directors are anxious to avoid the necessity of having to repeat their application to Parliament for many years, and thus prevent future expense on that account. With respect to the experimental meter for testing purposes, the directors would observe that the present Act stipulates for its position at the works of the company, and six hours notice to be given; which in the proposed bill is reduced to two hours only. The directors are happy they can so far accord with the Gas Bill Committee as to accede the point they name respecting our "unusual deficiency of coals," being omitted from the clause in the proposed bill. There is also the item of meters to the public lamps, respecting which the committee raise an objection to what was never intended by the gas company to have the bearing anticipated in the report, and the company is perfectly willing to agree to the committee's suggestion that a maximum average of one meter for every ten lamps shall be sufficient, or even slightly to exceed the number of ten if required.

(Signed) JOHN READ.

Mr. Thomas Lewis, Town Clerk, Tunbridge Wells.

To this (Mr. Browell continued) the committee, after meeting and considering the letter, returned this answer:—

Town Hall, Tunbridge Wells, March 25, 1874.

Sir,—I am directed by the Gas Bill Committee to reply to your letter of the 12th inst. As a reason for having refused the committee's very fair proposals of purchase, your directors now allege a want of power, both on their own part and on the part of the local board, to carry out the contract. The obvious answer to this is, that if the conditions of purchase were agreed on, they might be readily embodied in a bill to be introduced into Parliament with the concurrence of your company, such bill, of course, containing all the requisite clauses to enable each party to complete the matter in a legal and binding manner. If your company continue to refuse all reasonable terms of purchase, it will be for the board to consider whether they shall introduce a bill into Parliament on their own account. For the present the committee will confine themselves to those clauses of your own bill which your directors refuse to alter. The committee cannot consent to prolong indefinitely the company's powers to keep their gas-works in their present situation within the town; a reasonable limit will therefore be insisted on before the parliamentary committee, if the bill goes before that tribunal unamended in this respect. The bill in its present form will enable the directors to indulge in a profuse expenditure on capital account, with a certainty of a very high interest upon the outlay, by charging 6s. per 1000 feet for the gas. In dealing with a company which has a practical monopoly, the committee do not think that the town should be altogether and in all future time dependent upon the directors forbearance in that matter, and therefore they must oppose the attempted large increase of radius and capital, and the high maximum in the price of gas, which they think should be reduced to 5s. The committee do not find, in the Gas-Works Clauses Act, 1871, any words which entitle the company to a previous notice of a visit for testing purposes, and they object to such an exceptional privilege being continued to the company by their present bill. The committee retain their strong objection to the proposed site at the High Rocks for the new gas-works, and, having obtained the opinion of an eminent gas engineer that the land at the north is equally well adapted for the purpose, the committee intend, in accordance with the recommendation already adopted by the board, to offer a strenuous opposition to the proposal of your company.

(Signed) THOS. LEWIS, Clerk to the Local Board.

Mr. John Read, Secretary to the Tunbridge Wells Gas Company.

It would be seen (Mr. Browell continued) from this correspondence that the gas company had consented to the words, "unusual deficiency of coals," being struck out, as an excuse for failure in the supply of gas, and also the restriction as to meters. Under the bill as first drawn, they would have had power to compel this town, at its own expense, to place meters at every lamp in the town, should the gas be purchased by meter. On this, however, nothing further need be said, but upon the other matters a good deal had to be said. The Gas Bill Committee thought, that so soon as the gas company had had time to establish their works in some other locality, they should be under an obligation to clear off the objectionable works from their present situation. The town was quite willing to give them ample and sufficient time, but why the company should then object to remove their works he could not understand. There was practical proof they did not want to keep them, because they had inserted in the bill an application to remove them. Another very important point was, that under their present Act they had a district described by a circle of 18 miles—a pretty large one—and now they wanted to have that extended to a circle of 24 miles. And, besides this, not having spent £32,000, they wanted to have power to raise capital to the extent of £122,000. Some of the gentlemen on the directorate might say, "We are men of business, we will not spend this money unless we see our way to a profit." An ordinary trader might say that, but then the town were now dealing with a company that had a monopoly to begin with, and had got power to divide 7½ per cent.—that was if 6s. per 1000 would give it them. Could there be a greater inducement to a body of men to go largely into outlay. If he and the other members of the board could get

7¼ per cent. for their investments, he felt satisfied there would be a rush for it. Yet this was what the directors could do. Then they should look at the question in this way—whether these powers could not be used oppressively. They had no right to trust any body of men, although the present directorate were very honourable men, townsmen interested in the welfare of the town, it might get into the hands of those who were not so honourable, and not townspeople; it might be bought up, and go into the hands of gentlemen in London. If they had the power they now asked for they might spend any amount of capital, even to £122,000, and then put the town up to the maximum charge of 6s. per 1000 for the gas, in order that they should get their 7½ per cent.

Mr. SHARP: And 10 per cent.

Mr. BROWELL said they could take 10 per cent. upon one portion. Supposing the bill went on, and the works remained in the hands of the company, which he hoped they would not, the committee did object very strongly to them having the power of investing such an enormous sum of money, and getting their 7½ per cent. out of the town. It would all come out of the town, because if they spent all this money they would raise the price of gas. This power was capable of great abuse. They were now going for an Act of Parliament which was to be of perpetual force, not for a limited time, and he would say that the board who had the interest of the town placed under their protection should not consent to a power which might be used so oppressively. The next matter he should advert to was of some importance, although he did not put it as so important as the one he had last referred to, that was the notice for testing purposes. The company said they ought to have two hours notice whenever a test was required. The object of the visit would in this way be thwarted, and the board could, under the General Gas Clauses Act, send a person to test whenever they liked.

Mr. DRAKE: And is there not an objection to the testing-place?

Mr. BROWELL said the board required the testing-place to be near the town-hall.

Mr. WIGG: And other places.

Mr. SHARP asked Mr. Brentnall whether he concurred with the opinion expressed by Mr. Cleminshaw.

Mr. BRENTNALL: I am quite in accord with him.

Mr. BROWELL, resuming, said he would next refer to the proposed site of the gas-works. The gas company had fixed on the neighbourhood of the High Rocks. He was sure there was a strong feeling in the town that it would be a great desecration of that beautiful spot to have gas-works there, with a tall smoking chimney, cottages, and buildings. It was a place that should not have been selected until a perfectly exhaustive process had been gone through to find a site somewhere else. It occurred to the committee that the site at the north was nearly, if not equally, as good in an engineering point of view, and one perfectly free from all objections. They, therefore, at the earliest opportunity, mentioned this. They had not consulted engineers at that time, but now a gas engineer of great eminence had told them that one site was as good as the other. There was a slight difference in the elevation, the northern site being six feet higher than that of the south; but that was a matter which the engineer treated as of no importance. They were also very near the railway, and could, at a small expense, lay down a tramway and have a siding, so that, in respect of railway facilities, they would be on a par with the south. The works, if placed in the south, would be a great annoyance for half the year, owing to the wind blowing from the east, so that the smoke, &c., would come over the common and the town, whereas in the north that objection would not exist. Another question, and a very important one, was that it was desirable for the interest of the town that the property of the gas-works should be in the hands of the commissioners—should be carried out by the town. There was a very general impression in the town that they ought to conduct the business themselves, and he considered that the interests of the town would be best served by that being the case. He could point out two or three reasons why he thought they could carry on the works more satisfactorily than the gas company. He then dealt with the question of compensation, and said that persons were not led to expect the same amount of income from a fixed investment as they were in the way of trade, and he would give them an illustration. The present capital of the company was £20,000, paying interest of 10 per cent., and £12,000 new capital, paying 7½ per cent. He believed that if this was a fixed principle, the whole would not average more than 6¾ per cent. To show his meaning, he referred to the case of the city of Glasgow, when the gas company had a capital on which the interest was precisely the same as in Tunbridge Wells—viz., 10 and 7½ per cent. The company went to Parliament for increased powers, the corporation, at the same time, promoted a bill of their own, and how did it end? It ended in an arrangement by which the property was vested in the corporation, they paying a compensation in the shape of an annuity of 9 per cent. on the old capital, which had been paying 10 per cent., and 6¾ on the capital on which they had been receiving 7½ per cent. It was precisely the same state of things in Tunbridge Wells. By that, if they calculated the interest, they would see that there would be a saving of £290 in interest alone. The company proposed to expend a considerable amount more capital; and probably, if the works passed into the hands of the town, they would expend something also. The town, however, would not think of paying interest at 7½ per cent.; and that, he might say, would be one source of gain. Then there was another item of expense, which Mr. Delves could tell them about, and that was the amount paid to the directors. They all knew very well that town commissioners never received anything. Then, again, there would be a saving in the price of land; for the three acres the commissioners would not have anything to pay—at all events, it would be mere agricultural land. A question had been asked that, supposing the board acquired the works, would they be willing to take the officers of the company with them. He replied that it would be for the interest of the town that they should employ those confidential servants of the company. There was another matter—the company had offices, and he thought, by a little judicious management, these offices could be removed to the town-hall, and a great expense would be saved there. These were five reasons why the town should have the works, and, taking these matters into consideration, it was quite certain it would be for the real interests of the town that the business of the gas-works should pass into the hands of the commissioners. They were now paying 5s. per 1000, and the price had been advanced owing to the increased cost of coal. He was prepared to say that it was not necessary, when coal advanced, to raise the price of gas in order to secure a fair profit, for, when coal went up, the residual products became dear also. In support of this view of the case, he read an extract from the annual report of the Crystal Palace District Gas Company, in which the chairman said that, notwithstanding the increased price of coal, they had done a very good business, and the directors had every reason to be satisfied. He (Mr. Browell) concluded by moving the adoption of the report, and expressing a hope that there would be a more peaceable disposition evinced by the directors.

Mr. BOSTON seconded the adoption of the report.

Mr. SHARP supported and spoke in corroboration of Mr. Browell's argument.

Mr. DELVES asked who was the engineer who had advised the board respecting the sites.

Mr. BROWELL said it was Mr. Cleminshaw.

Mr. DELVES said that if Mr. Cleminshaw had informed them that the north was as good as the south, he would not give a great deal for his opinion unless that opinion was considerably qualified. First there would be a great expenditure—as much, probably, as the ground would cost—to get a railway siding; and after they had got that the tariff which the South-Eastern Railway would charge would be so much higher than that of the London and Brighton Company, that there would be no comparison. He also said that, by going to the north, they would be greatly injuring a number of valuable buildings; and when he visited the place he was surprised to see so many fine mansions within sight. There had been a great deal said about horrid chimney smoke, but, in the present day, it was not necessary to have tall chimneys, and there was very little smoke. There was no secret about it now, and he might say that what they were going to pay for the site on the south was £1500. With regard to the question of increased capital, he reminded them that a private company was not in the same position as a board, and that they could not go every year for powers to borrow money. The company had always been remarkably careful in their expenditure, and would continue to be so. He asked that, in the event of the company abandoning the southern site, or being prevented having it, whether the committee were ready to intimate that they might have the north.

Mr. BROWELL: No; we must have it in our own hands.

Mr. DELVES thought that was rather strange, preventing the company having one site, and then not hand over the site they were so anxious about. He believed that there would never have been any desire on the part of the board for them to go to the north had they not had this piece of land on hand. He deprecated the opposition, and stated he had no fear at all of the result of that opposition. On behalf of the gas company, he was convinced that when they got before the parliamentary committee they would be able fully to establish their case, and that the committee would listen to very little, if any, of the opposition offered.

Mr. WIGG wished to remind the board that if the company were allowed to raise £120,000, it would be a matter of impossibility almost for the town to purchase. It was a question of now or never. He could only say, from his connexion with the largest gas-works in London, that the residual products compensated for the high price of coal. In London they had a difficulty to get rid of them, while at Tunbridge Wells there was a difficulty in getting them.

Mr. BROWELL having briefly replied, the report was adopted.

LOCAL GOVERNMENT BOARD INQUIRY AT RYDE.

The Corporation of Ryde having made an application to the Local Government Office for a loan of £1415 to pay for new lamp-columns, &c., Colonel Cox, R.E., was appointed to investigate the matter, and to hear any objections thereto. A memorial had been lodged in opposition, but was subsequently withdrawn. The inquiry took place in the Old Town-Hall on the 30th ult.

Mr. BLAKE appeared for the corporation, and Mr. BARROW, one of the memorialists, attended to watch the case for himself and fellow-ratepayers, although, as he said, there was no intention to oppose the borrowing of the money.

After much desultory conversation as to the circumstances under which the application was made, it having been alleged in the memorial that the contract for the lamp-columns was illegal for want of proper notice, that the price paid for the columns was excessive, and that it was inexpedient to sanction a loan for work done before authority to raise the money had been obtained, the inspector proceeded to hear evidence.

Mr. *G. H. Stayton*, borough surveyor, said the estimate in his report sent to the Local Government Board was £1415—for 220 columns at £2 10s., scrolls 5s., lanterns £1 5s., meters and fittings £1 17s.—£5 17s. Altogether there were 173 belonging to the gas company, and the council would have had to make up the difference of 47. Had they purchased the old columns, after arbitration, at an average price of £2 10s.—that was a moderate price, inasmuch as the council were paying £96 a year as 10 per cent. upon the cost of them, including repairs, equalling £5 11s. per lamp—the cost would have been £432 10s.; meters, boxes, &c., for each would have cost £6 10s. each, or £1124 10s. Had they adopted for the additional 47 lamps, the same lamps and meters as at present were used, the further cost would have been £294—total £1851. Had the council used the same kind of meter as for the 173 lamps, the further cost would have been for the 47 lamps and meters £517—giving a total of £2074 as against £1415. The council had adopted the positive, and not the average meter system. In cross-examination, he stated that he did not consider the old columns belonging to the gas company were in substantial repair, as some of them had been in use for many years.

Mr. *G. Glover* said he was the author of "The Gas Consumers Manual;" formerly Lecturer on Mechanical Philosophy, Royal College of Surgeons, Edinburgh; Vice-President of the Royal Scottish Society of Arts; Superintendent Inspector General Board of Health, Whitehall; and Member of the Society of Arts, London; patentee of the national standard gasometer and improved dry gas-meter, &c. The Government had adopted his meter. There was a notice in the *London Gazette* authorizing public inspectors throughout the country to use his meters as test-meters. He was satisfied that the Ryde Town Council had adopted the only method that could restore mutual confidence between the public and the gas company by making every individual lamp a consumer. The gas company were thus assured of payment for all the gas consumed by the public lamps, and the corporation assured of having received all the gas they paid for. Under the average system it was very obvious the person who had charge of the lighting could make the metered lamp consume either more or less than the general lamps, and he did not know of any instance in which the average system had restored confidence in any town. The parishes of St. Pancras and Paddington were now in controversy with the Imperial Gas Company, and claiming a margin of error of 20 per cent., either fast or slow, upon their average meters. They are wet meters, costing £6 10s. each. The company were limiting the dispute, if possible, to 10 per cent. on each side. In Southampton he found a meter to every 10 or 15 lamps; they were paying £7 for each meter, and were filling them with glycerine, which cost very nearly as much as the meters, to prevent their being frozen in winter. That was not necessary in dry meters. Glycerine very often contained an acid which corroded holes in the white metal drum of the wet meter. They were mixing the glycerine with two-fifths of water, and one-fourth of a vessel of that fluid standing on the mantelpiece at the gas-works had evaporated in three months. The position on the mantelpiece would be more favourable to evaporation than in the meter. He thought having a meter to each lamp a very wise proceeding. Under the average system there was always distrust. The meters here cost, not £6 10s., but £1 2s., and 14s. 10d. each fixing. Had dry meters been fixed to the old columns, a separate box must have been sunk in the ground, and that was open to great objections. The box was liable to get flooded from the soil, and the sinking of the meter below the level of the main frequently flooded the meter from the main, which was bad for either a wet or dry meter. He considered the course which had been adopted as the best—a perfectly wise and prudent arrangement—and that the council had shown an example which would be very extensively followed. In cross-examination, he said he supplied the meters. He was not aware that the meters were flooded now, and the boxes rusty in consequence of the natural propensities of dogs—he was extremely doubtful of that.

The BOROUGH SURVEYOR said it was not the fact.

Mr. *J. E. Greatorex*, civil engineer, and borough engineer and surveyor for Portsmouth, said he had had considerable experience for 20 years. He considered the cost incurred at Ryde fair and reasonable by comparison with what they had done. The average of six or eight tenders at Portsmouth for lamp columns, without arms, meter-boxes, doors, &c., was £2 15s., they ranging from £2 5s. to £3 15s.—the arms afterwards cost 2s. 6d. each. The average system was tried at Portsmouth, and given up as totally unsatisfactory. He

considered it more convenient and satisfactory that meters should be attached to every lamp—that the Ryde Corporation had done right, and effected a considerable saving.

By Mr. BARROW: At Portsmouth the lamps to which meters were attached were always in much better order than others. He was not prepared to state whether in any town the cost of lighting by meter had been less than by contract. He did not know of any case in which the meter system had been given up from being more expensive than contracting. The average system at Nottingham, some years ago, was very unsatisfactory; he did not know what it was now.

Mr. BARROW said the memorialists considered the average system a very good one, and quite as likely to answer as the positive. At Ventnor the system was one to every six, and it had worked to their satisfaction for two or three years. Wet meters were used, but no chemicals were applied. They held that one in six or ten was sufficient, and £331 6s. might have been saved by adopting that course. Then they said that the old columns might have been bought as they stood at £4 per lamp; 40 new meters, at £6 8s. 6d., would be £257, which would leave a difference of £438. Had the old columns been altered, the expense of altering and putting in meters would have been £1 8s. 6d., making the total £598 below the £1415.

Mr. BLAKE said Mr. Stayton informed him that the cost would be £6 or more, not £1 8s. 6d.

Mr. *G. Garnett*, manager of the gas-works, said his opinion was that if the 194 old columns, brackets, &c., had been purchased by arbitration, as provided by the Act, and that if the large meter, such as that used at Nottingham and Ventnor—and it was the very best meter—had been applied on the average system, the whole thing might have been done for £500.

Cross-examined by Mr. BLAKE: He allowed one in ten, and a little over £7 for each meter. They cost about £6 10s. at Ventnor. He was a director of that company, and the meters worked satisfactorily. The old lamps would burn 5 feet per hour—20 if they wanted it; 21 of the 194 were brackets. He had no doubt glycerine might be a very good thing, but the meters at Ventnor worked very well without any. Methylated spirits was as good as glycerine. In winter the meter must be surrounded by a non-conductor. Water was kept out by an india-rubber ring being tightly screwed down.

Mr. BLAKE said the same meter was used at Ventor, Southampton, and Nottingham. At Southampton they did find it necessary to use glycerine.

General *Jeffreys* said the origin of the whole of this question was the continual disagreement every quarter between the council and the company as to the deduction for bad lights; the police reported that they were continually increasing. One great object in adopting this system was to avoid fights and disagreements. Under the average system there would have been the same disputes.

Mr. RENDALL said the company thought the meter system most satisfactory to all.

The MAYOR said it was honourable on his part to say that it was so satisfactory to the company, as it justified the course adopted by the corporation.

Mr. RENDALL believed it was a benefit to the town and the company, but he did not say which would be the best system.

The MAYOR then handed in a statement of the corporation accounts, showing that they had borrowed £10,000 more than they were authorized to do.

The INSPECTOR, in closing the inquiry, said he hoped all who had attended felt that the time taken up had not been in vain. He thought it had not been unprofitably spent. It was very much to be desired that all questions of that kind, instead of being allowed to simmer, should come to a point, in order that they might be dealt with. He hoped that was the view of every gentleman present. It appeared that bad lights were complained of, in which case the only duty of the council was to bring the matter to a satisfactory issue one way or another; and it was very evident they gave this part of their business very full consideration—that they inquired as to what might and might not be done, and as to wet and dry meters—and it must be highly satisfactory to the ratepayers to know that, after giving so much consideration, they had arrived, after due deliberation, at that conclusion. Having, in the exercise of their liberately adopted them. He was sure they did it believing it was best for the judgment, decided that the dry meter and positive system were best, they detown, and that was what they were bound to consider. Then they went to the Local Government Board to borrow the money, as it would be a hardship to levy it by a rate. He thought all that had passed that day must be satisfactor to all the ratepayers. As far as he was concerned, he was very glad the inquiry had been held.

ALLIANCE AND DUBLIN CONSUMERS GAS COMPANY.

The Half-Yearly Meeting of this Company was held on the 31st ult., Mr. E. FOTTRELL in the chair.

The SECRETARY (Mr. Cotton) having read the notice convening the meeting, the following report and accounts were submitted:—

The directors send herewith a statement of the company's accounts for the half year ended the 31st of December last, which shows a loss on the half year's operations of £9464 12s. 1d.

While regretting to have to submit such a statement, the directors feel that you will not be surprised at this result. The facts already stated to you at the special general meeting, held on the 21st of January last, at which you granted permission to go to Parliament for a new bill to reduce the illuminating power of the gas, distinctly showed that no better report could be expected.

The accounts now submitted, compared with the corresponding period of last year, show an increase in the cost of coals and purifying materials alone of £20,500, whilst the price of gas has been unaltered.

Much embarrassment was caused by the bill promoted by the Corporation of Dublin last year, inasmuch as the agreement entered into with that body debarred your board from making any contracts or giving orders for any goods save what were actually required for immediate use. It was not until the month of June that this bill was finally abandoned, at which time the state of the coal market was such as caused great anxiety to your directors, not only on the question of price, but likewise of supply, for it was feared that, from the disorganization at the collieries, such a supply would not be forthcoming as would be adequate to enable them to continue the lighting of the city during the winter. These circumstances have acted prejudicially to your interests, inasmuch as to ensure a *full* supply, the directors had to enter into contracts for much larger quantities than were required (sufficient for the company's requirements up to next autumn), as previous experience had shown that deliveries were made only in proportion to the extent of contracts entered into.

The directors think it right to state that the enhanced expenditure for coals would have been far greater but that some deliveries on old contracts, entered into on very advantageous terms, have been made during the past half year. These old contracts are now nearly exhausted.

Your directors are adopting every possible means at their disposal to improve the carbonizing department of the company, and to reduce the leakage, or unaccounted-for gas, to a minimum. In every department they have reduced the expenses, so that with regard to strict economy of working a concern of such magnitude, they do not fear a comparison with any other gas undertaking.

In accordance with the desire expressed by the shareholders, they have presented a bill to Parliament to reduce the illuminating power of the gas to 16 candles, and they feel every confidence that no opposition from any quarter will be made when the statement of facts exhibited is fairly and honestly considered. They are confident the gas consumers would not expect that any manufactured article would be supplied at less than cost price, or that the shareholders who have placed their money in the undertaking should not be fairly recompensed for their investments.

The Corporation of Dublin have promoted a bill in this session, having for its object the compulsory purchase of your works, in regard of which the directors are taking the necessary steps to protect the interests of the shareholders.

Two of the directors, namely, Messrs. Fottrell and Drimmie, retire by rotation, and being eligible, offer themselves for re-election.

One of the auditors, Mr. J. Heyland, also retires by rotation, and is eligible for re-election.

Dr. *Capital Account, for the Half Year ended Dec. 31, 1873.* *Cr.*

			Total to Dec. 31, 1873.
1. To Expenditure to June 30, 1873	..		£658,369 17 10
2. Expended this half year on additional work at stations	£730 5 2		
3. New mains and services	1,576 6 6		
4. New meters, fittings, &c.	660 17 2		
5. Parliamentary expenses	633 11 0		
		3,609 19 10	
Total expenditure to Dec. 31, 1873.	..		£661,979 17 8
Balance of capital account	..		71,745 2 4
			£733,725 0 0

	Certified Receipts to June 30, 1873.	Received during Half Year.	Total Receipts to Dec. 31, 1873.
1. By Class A shares, £10	£189,808 0 0	£70 0 0	£189,878 0 0
2. ,, B ,, 10	89,216 10 0	9,469 10 0	98,686 0 0
3. ,, C, No. 1 . 10	135,000 0 0	..	135,000 0 0
4. ,, C, ,, 2 . 10	147,619 0 0	15,042 0 0	162,661 0 0
	£561,643 10 0	£24,581 10 0	£586,225 0 0
5. Bonds	..	..	147,500 0 0
	..	..	£733,725 0 0

Dr. *Revenue Account, for the Half Year ending Dec. 31, 1873.* *Cr.*

Manufacture of gas—				Sale of gas—	
Coals, including dues, carriage, unloading, and all expenses of depositing same on works		£79,546 9 9		Gas (262,331,600 cubic feet), at 5s. 6d. per 1000 cubic ft.	£72,141 4 0
Purifying matrls., oil, water, and sundries at works		1,131 0 2		Gas (26,063,800 cubic feet), at 4s. 6d. per 1000 feet.	5,864 7 3
Salarics of engineers, including chief engineer, superintendents, and officers at works		1,593 12 9		Public lighting, and under contracts	5,423 9 6
Wages at works		8,568 9 3		Rental of meters	2,480 3 6
Repairs and maintenance of works and plant (including renewal of retorts), machines, apparatus, tools, materials, and labour		7,236 2 3		Residual products—	
		£98,075 14 2		Coke, less labour and cartage	14,938 16 2
Less old material sold		193 14 1		Breeze	1,534 14 3
		£97,882 0 1		Tar	2,486 15 7
Distribution of gas—				Ammoniacal liquor	2,002 16 6
Salaries of surveyor, chief inspector, inspectors, assistant inspectors, and clerks in light office		922 12 4		Rents	276 18 4
Repair, maintenance and renewal of mains and of service-pipes, including materials, laying and paving, and labour		1,914 14 0		Transfer fees	71 10 0
Repairing, renewing, and refixing meters		1,487 11 3		Balance carried to profit and loss account	5,755 17 4
Public lamps—					
Lighting and repairing		984 0 8			
Rents, rates, & taxes—					
Rents		882 13 7			
Rates and taxes		2,771 4 11			
Management—					
Directors allowances		353 9 3			
Salaries of secretary, accountant, and clerks, office-keepers, and messengers		892 9 2			
Collectors commission		861 12 11			
Stationery and printing		269 10 3			
Genl. establishment charges and incidentals		1,386 16 6			
Company's auditors		15 0 0			
Law charges		486 4 7			
Bad debts		948 19 0			
Abatements&allowances,&c.		782 11 2			
Deficiency in late cashier's account	£395 2 9				
Less amount from National Guarantee Society	150 0 0				
		245 2 9			
		£112,996 12 5			£112,996 12 5

The CHAIRMAN, in moving the adoption of the report, said it was with much regret that he, on his own part and on that of his brother directors, came before them to-day under the circumstances which were submitted in the report that had been published. It, however, was not for want of attention to the business of the company by the directors that such an unfavourable state of facts had occurred, for a review of the half year would show, when compared with the same period last year, a fair increase in the rental amounting to £5000. On the other side, they should consider that coals had cost a sum of £20,000 more, and this it was that caused the state of things they had at present to meet. This was the circumstance that had brought about this unfortunate position, for had coals remained at the price at which they were, the directors would, even with a power of 20-candle gas maintained, have been now paying a dividend. There was, however, a difference of 9s. a ton in coals, compared with last year's accounts. Besides this there was a difference of £2000 additional expense in the making of the gas, showing a sum of 5s. 7d. a ton on the coal. Under all these circumstances he thought the shareholders could hardly be surprised at the statement of accounts submitted. The charges on the working of the concern had been, he could assure them, kept down to the lowest possible point, and had, in fact, reached the very minimum cost of production of gas. The expenses of the entire working and distribution had come to only 12s. 6d. a ton, which would contrast most favourably with the working of any other gas company. The residual products had not been quite so good as they ought, although they showed a surplus of £1000, inasmuch as the coke made from cannel coal was not of that quality which met with a good market. These were the circumstances which had led to the present state of things. To remedy it, as was explained at a previous meeting, the directors had brought a bill into Parliament to enable them to reduce the illuminating power of the gas from 20 candles to 16, charging the same price for it as now charged for 20-candle gas. Such an arrangement they confidently hoped would place the company in the position which it occupied for so many years. The increased rental showed the vitality of the concern, and the extent to which trade could be developed, so that even if a small profit be obtained it would soon change the figures from the wrong side to the right side of the account, and the shareholders get a dividend for the money they had invested.

Mr. DRIMMIE, in seconding the motion, expressed his extreme regret at the

very unfavourable results which the accounts conveyed, and his sympathy with those shareholders of the company who were in humble circumstances, and invested almost the whole of their savings in that undertaking, which was considered by many persons, himself included, as one of the safest and soundest of their commercial enterprises. But although the present circumstances were disappointing, he anticipated that if anything approaching to fair play should be extended to the company, in addition to the vigorous management now inaugurated, they would be enabled to retrieve their position, and resume the payment of dividends corresponding somewhat to the risks they ran, and the contingencies to which their capital was constantly exposed. Under ordinary circumstances they would have had to congratulate the shareholders on some items in the account, as, for instance, in the increase in their business, evidenced by the fact that their half year's revenue was £7000 greater than that of the preceding half year; but their present exceptional position of being obliged to sell gas at a price lower than the cost of production, brought with the extension of business an increased loss. Their present annual sale of gas was 100 million cubic feet more than it was in 1867, the year following the amalgamation of the company, which, he thought, afforded very satisfactory evidence of the increasing prosperity of Dublin, in which, unfortunately for them, some of their fellow-citizens did not seem dispose to allow the company to participate. At present the concern was being worked with rigid economy in every department, so much so that their expenditure was much more moderate than that of most companies of the same magnitude; but as long as the material from which gas was manufactured maintained its present price, it would be impossible for the company to do otherwise than lose until it obtained adequate relief. The following statistics would show beyond dispute that the company were entitled to the relief for which they sought. In 1867 the coal carbonized at their works cost 18s. 3d. per ton, and the cost of manufacture and distribution of the gas amounted to 9s. 8d. per ton; in 1868 the cost of coal carbonized was 17s. 11½d., and of manufacture and distribution 11s. 1d.; in 1869 the cost of coal carbonized was 17s. 10½d., and of manufacture and distribution 10s. 11½d.; and the cost under the same head subsequently was—for 1870, 16s. 2⅝d. and 10s. 0½d.; for 1871, 15s. 10d. and 10s. 9½d.; for 1872, £1 1s. 11d. and 11s. 1d.; and 1873, £1 8s. 1⅝d. and 12s. 3½d. respectively. From these figures the remarkable fact would be noticed that last year their coal alone cost more per ton than the average yearly cost, not only of the coal itself, but also of the manufacture and distribution down to the year 1872. In 1871 the cost of coal and carbonization together amounted to £1 6s. 7½d., as against £2 0s. 3½d. in 1873, the increase being 13s. 8½d. on each ton of coal carbonized in 1873 as against 1871; and this being calculated on 101,401 tons carbonized in 1873, entailed a total increased expenditure on the year's working, over which the directors had no control, of no less than £69,396 6s. 2d., an amount sufficient in itself to provide upwards of 11½ per cent. dividend on their paid-up capital of £586,225. It might be contended that the comparison should be restricted to the years 1872 and 1873, in which 20-candle gas was supplied to the citizens of Dublin. But, taking it on that basis, it would be found that coal and manufacture cost them £1 13s. in 1872, as compared with £2 0s. 3½d. in 1873—a difference of 7s. 3½d. per ton, which on 101,401 tons carbonized amounted to £36,969 2s. 3d., a sum sufficient to provide the shareholders with 6¼ per cent. dividend on their capital. He commended these figures to the honest consideration of the citizens of Dublin; and also the fact that if the company had been working last year under the relief now sought for, it would be found to be inadequate to meet their loss. It had been assumed that the reduction of four candles was equivalent to an increase of 1s. per 1000 feet in the price. On this basis, the relief sought under their bill would amount to only £30,000, an amount very much less than the true loss they were sustaining by the greatly increased prices of material as compared with former years. He hoped no section of the citizens of Dublin would be found to persevere in any efforts to inflict upon the company such a grievous injustice as now appeared to be contemplated. They could ill afford to bear the expense of a parliamentary contest at present, and he trusted that the moderate relief they claimed, as compared with their heavy loss, would be accorded to them with that good grace and sense of honesty and fair dealing which had always been characteristic of the citizens of this great city.

Mr. MACREADY concurred with the observations of Mr. Drimmie. The causes of the loss sustained were exceptional. Owing to the company being in treaty with the corporation for the disposal of their property, the directors had been debarred from making contracts at a suitable time; and it was only when, to their utter astonishment, the bill was thrown out, the directors had to rush into the market, and buy as best they could to prevent the collapse of the works.

Mr. DARCY said no blame could be attached by the shareholders to the present executive, for before they came into office the late directors had contracted for coal, at a very high price, which would last till next October.

Mr. MACREADY referred to a recent letter from the corporation, asking whether the directors were at present prepared to recommend a sale of the company's property to the corporation, and at what price; and a reply from the board of directors, stating that under present circumstances they could not entertain the question. He thought if the directors had said that they were now willing to treat with the corporation, they would not deserve to be kept an hour in their places. None but lunatics, in the present state of the concern, would advocate a policy of sale. Nor could the corporation for one instant continue to represent the citizens of Dublin if they accepted sale of the company's works in their present state. So that, in whatever way it was viewed, the sale and purchase were unjustifiable. The directors, therefore, very properly said they were not at present disposed to recommend the shareholders to sell the works to the corporation. They wanted to avoid the disagreeable and expensive proceeding of opposing each other in Parliament; and therefore they arrived at the conclusion that, inasmuch as the legislation would likely cost £5000 or £6000, they would not recommend the sale of the works. He concluded by proposing the following resolution:—"That we are of opinion that the directors should withdraw all opposition to the bill of the corporation, provided that body are satisfied to take powers to purchase by agreement, within a period of three years, and, failing the agreement by years, powers to purchase by arbitration for one year, the corporation undertaking to withdraw all opposition to the company's bill."

The CHAIRMAN intimated that it would be better in the first instance to allow the motion for the adoption of the report to be carried. He said that from the beginning the directors had given this subject their most earnest attention, and he had to state distinctly, on the part of himself and his colleagues, that they could not enter into any negotiations with the corporation at present. There was no hostility between them and the corporation; but, as guardians of the property of the shareholders, the directors believed that it would be injudicious on their part to take any course but that which they were now taking—namely, that of petitioning against the compulsory powers sought by the corporation in their bill.

Mr. MOLLOY asked a question as to the loss by leakage.

Alderman TARPEY thought it highly irregular to ask such a question. There was no use in ripping up old sores, or exposing any former malpractices or extravagances of the company.

The CHAIRMAN said he had no objection to answer the question. The leakage last year was 25 or 26 per cent.

The report and accounts were unanimously adopted.

Mr. MACREADY said that, instead of proposing a resolution to the effect which he had mentioned, he would leave the question of the parliamentary bills in the hands of the directors, being satisfied that they would do everything in their power to avoid a contest.

The outgoing directors, Messrs. Fottrell and Drimmie, were re-elected, and Mr. Lawlor was elected auditor in the place of Mr. Heyland.

The CHAIRMAN stated that in the course of alterations in the office they had dispensed with the services of an old officer of the Company, Mr. Overend, who had originally come to them from the Hibernian Gas Company when they purchased up that company. He had conducted his business with perfect integrity and honesty, and had been for 37 years continuously in the service of the Hibernian Gas Company and of this company. They had paid him his salary up to December next, and he was then to get £100, being equal to half a year's salary. He (the chairman) brought the subject before the meeting in deference to the wishes of 250 shareholders, who had signed a memorial in favour of Mr. Overend.

Dr. WALLER moved that a retiring pension of £100 a year be given to Mr. Overend, but

The CHAIRMAN said he could only receive the proposition as a notice of motion for next half-yearly meeting.

Dr. WALLER gave notice of motion accordingly.

The CHAIRMAN remarked that in the meantime no detriment would accrue to Mr. Overend, for he would be paid the £100.

Mr. DRIMMIE having returned thanks on his re-election,

A vote of thanks was given to the chairman and directors, and this terminated the proceedings.

OPPOSITION TO THE DUBLIN GAS BILLS.

On Wednesday last, a meeting of ratepayers and gas consumers took place in the Molesworth Hall, Dublin, for the purpose of "petitioning Parliament against the bills now pending, conferring unlimited taxing powers upon the corporation, and otherwise injuriously affecting the interests of the ratepayers and gas consumers of Dublin and suburbs"—Mr. A. PARKER in the chair.

The CHAIRMAN said his earnest desire was to be of some little use in bringing this gas controversy to a favourable termination without a parliamentary litigation, which was an extremely costly affair. A little concession on the parts both of the gas consumers and the gas company might enable them to adjust matters, and, if that was the result of the meeting, he would greatly rejoice.

Mr. JOHN M'EVOY stated that the matters at issue were extremely few and simple. As regarded the corporation, they sought powers to make such arrangements as would bind the ratepayers to any sum they thought fit to ask. No such power had ever been conferred by Parliament on any corporation, and that meeting would have to say whether it was desirable to create a precedent in favour of the Dublin Corporation. Then, with regard to the gas company, they were not the first company in the world that had been in difficulties in consequence of the rise in the price of coal. Their case was the case of every gas company in the United Kingdom. The law, in such cases, had provided an appeal to the Board of Trade, which appointed experts to investigate the whole matter, but the company, as was their constitutional right, had chosen another tribunal; but it would be for the meeting to say whether, on appearing before the tribunal, they would be allowed to establish their case other than by the same strict proof that they would before the Board of Trade. In the case of the Board of Trade investigation, they should prove due care in management, and the relief given to them would be for a time only, and not permanent, as sought for in their bill.

The CHAIRMAN said Mr. M'Evoy's was a very clear statement, but he thought there was a third issue, and that was whether the corporation were to have the power of making gas for them at all. He thought that was a main issue.

Mr. THOMAS PIM, jun., proposed the first resolution, as follows:—"That, in the opinion of this meeting, it would be disastrous to the interests of the citizens of Dublin if the bill now before Parliament, promoted by the corporation for the purchase of the undertaking of the Alliance Gas Company, should become law, and we hereby pledge ourselves to oppose it most strenuously. That it is also necessary, in order to protect the interest of the citizens and gas consumers, to obtain a *locus standi* against the bill of the Alliance Gas Company. Resolved, therefore, that petitions be presented against both bills." After referring to the course of events in connexion with the gas supply of the city since the passing of the company's Act in 1871, he said there were three great points he wished to urge—that the company should be satisfied with 5s. instead of 5s. 6d. per 1000 feet; that they should consent to have a public tester appointed under the Board of Trade; and that they should make some arrangement by which all these difficulties may be settled in future by the Board of Trade, and so save the frightful expense of parliamentary contests. They, therefore, petitioned against the company's bill, not in any unfriendly spirit, for they believed they had grounds to be relieved in some respects. As to the bill of the corporation, they had come to the conclusion to oppose it most strenuously, for the management of their own affairs was not such as to induce the citizens to hand over to them this great monopoly of the distribution of gas.

Mr. J. BAGOT seconded the motion, and said he thought it would be well, if possible, to obtain an amicable settlement with the gas company. Those who were acting on behalf of the citizens had no desire to act in a hostile spirit towards the gas company. It was very different from the case of the corporation. The latter under their present bill endeavoured to take powers to tax the citizens to what might be called an unlimited extent. They wanted not only to become a corporation, but to become gas merchants, and if they became unsuccessful as such, instead of having a large profit, they would turn round on the citizens and say, "You must make good our loss." The cost of carrying on the opposition against the corporation bill would be very great, and the citizens should supply the "sinews of war" to meet it. He hoped and believed they would be successful, and that the citizens would be saved from being placed in a most ruinous position.

Mr. WM. HAUGHTON, chairman of the Great Southern and Western Railway Company, supported the proposition. He had come from a meeting of the directors of his company, and was authorized to state that the present opposition to the bill met with their approval. They had not a personal interest in it, as they made their own gas, but as they considered the opposition was in the interest of the citizens, they subscribed a sum of £50 towards it.

The motion was put and carried; and the proposed petitions against the bills submitted, and adopted. It was also resolved that a subscription list be opened to pay the expenses of the opposition, and a committee was appointed to carry out the preceding resolutions. It was stated that some of the gentlemen present had put down their names for sums amounting in all to about £300.

Thanks having been voted to the chairman, the proceedings closed.

KINGSTON (SURREY) GAS COMPANY.—At the half-yearly meeting of the shareholders of this company it was reported by the directors that they had found it necessary to erect another holder in order to provide sufficient storeage room to meet the requirements of the district. Tenders for the brickwork of the tank were invited, and that of Mr. Edwin Wells, of Eden Street, Kingston, was accepted. The new holder, which is to be erected by Mr. Howard, of Birmingham, will be 84 feet in diameter, and when fully charged will be 45 feet in height from the base of the tank. Its capacity will be 230,000 cubic feet, and when completed the company will be prepared to meet almost any emergency that may arise.

METROPOLIS WATER SUPPLY.

The following are the returns of the Society of Medical Officers of Health on the composition and quality of the metropolitan waters in March, 1874:—

Names of Water Companies.	Total Solid Matter per Gallon.	Oxygen required by Organic Matter, &c.	Nitrogen.		Hardness.	
			As Nitrates, &c.	As Ammonia.	Before Boiling.	After Boiling.
Thames Water Companies.	Grs.	Grs.	Grs.	Grs.	Degs.	Degs.
Grand Junction	20·83	0·083	0·114	0·002	15·8	4·0
West Middlesex	20·90	0·060	0·130	0·005	15·8	4·6
Southwark and Vauxhall	20·63	0·071	0·114	0·0075	15·8	4·2
Chelsea	21·23	0·071	0·114	0·0075	15·8	4·2
Lambeth	No return.					
Other Companies.						
Kent	28·16	0·003	0·137	0·003	21·2	6·0
New River	19·2	0·015	0·114	0·004	15·8	3·3
East London	21·56	0·034	0·164	0·006	16·5	4·2

Note.—The amount of oxygen required to oxidize the organic matter, nitrites, &c., is determined by a standard solution of permanganate of potash acting for three hours; and in the case of the metropolitan waters the quantity of organic matter is about eight times the amount of oxygen required by it.

The water was found to be clear and nearly colourless in all cases but the following, when it was slightly turbid—namely, Chelsea, Grand Junction, and Southwark and Vauxhall.

C. Meymott Tidy, M.B. (*for* Dr. Letheby.)

The Registrar-General publishes the following returns of the average daily quantity of water supplied by the London water companies, during the month of February, 1874. According to these, 109,013,458 gallons, or 495,298 cubic mètres of water (equal to about as many *tuns* by measure, *tons* by weight) were supplied daily; or 214·4 gallons (97·4 decalitres), rather less than a *ton* by weight, to each house, and 30·2 gallons (13·7 decalitres) to each person. According to returns of the London water companies made to the select committee on East London Water Bills (session 1867), it is estimated that, during the year 1866, about 82 per cent. of the total supply of water for all purposes was for domestic use. Applying this proportion to the total quantity supplied daily in the month of February, 1874, it may be estimated that about 89,391,036 gallons were probably used for domestic purposes, or about 24·8 gallons per day for each inhabitant, against 23·2 in the corresponding month of last year. This proportion doubtlessly varies from month to month, but the Registrar-General has no means of giving a more exact estimate.

Companies.	Number of Houses, &c., supplied in		Aver. Daily Supply of Water in Gallons* during	
	Feb., 1873.	Feb., 1874.	Feb., 1873.	Feb., 1874.
Tetal supply	501,476	508,465	100,703,407	109,013,458
From Thames	234,274	238,486	53,403,407	57,172,144
„ Lea and other Sources	267,202	269,979	47,300,000	51,841,314
Thames.				
Chelsea	28,247	28,395	7,519,800	8,103,600
West Middlesex	44,330	45,387	8,599,461	8,673,611
Southwark and Vauxhall	79,147	79,550	16,461,755	18,126,320
Grand Junction	33,500	34,718	10,373,591	10,702,613
Lambeth	49,050	50,436	10,448,800	11,566,000
Lea and other Sources.				
New River	120,810	121,855	21,243,000	23,864,000
East London	104,637	105,562	19,970,000	21,674,000
Kent	41,755	42,562	6,087,000	6,303,314

* Including that for manufactures and for various purposes other than for domestic consumption.

Note.—The return for February, 1874, as compared with that for the corresponding month of 1873, shows an increase of 6989 houses, and of 8,310,051 gallons of water supplied daily.

Dr. Frankland, F.R.S., reports, as the result of the chemical examination of the water supplied to the metropolis during March, that taking the amount of organic impurity in a given volume of the Kent Company's water as unity, the proportional amount of this impurity in an equal volume of water supplied by each of the other metropolitan water companies during that month was—New River, 1·6; East London, 3·7; West Middlesex, 4·3; Lambeth, 4·6; Grand Junction, 4·7; Chelsea, 4·9; and Southwark, 5·0. All the waters drawn from the rivers Thames and Lea, except that supplied by the New River Company, was "much polluted by organic matter." The water supplied to London during March by each of the metropolitan companies, except the Kent, New River, and West Middlesex Companies, was "slightly turbid, and contained in each case living and moving organisms; it was not fit to be used for dietetic purposes." The Kent Company's deep-well water maintained its usual brightness, purity, and wholesome qualities.

Birmingham Water Supply.—Dr. Hill, the medical officer of health for Birmingham, reports that the water supply to that town during March, was "slightly turbid, and contained a largely increased proportion of organic matter."

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND DERBYSHIRE.

(from our own correspondent.)

Matters remain in much the same condition as when last reported upon. In the lighter departments of the local iron-works there is no visible amendment, but at one or two of the chief establishments the heavier branches appear to be manifesting rather more activity.

The founders are still fairly busy on heavy colliery castings, gas and water pipes, and the like.

The inquiry for brass foundry and general brass goods is not on a less scale than when last alluded to.

The dull state of the local house and steam coal trade has not undergone any change during the week. House coal meets with a very slow sale, both at the London and country depôts, consequently stocks are still accumulating, in spite of the fact that at none of the pits are the miners working more than three or four days weekly. Steam coal and engine slack are in but indifferent request, the latest reduction not having brought about any increased activity. Average prices are now—Best house coal, 15s. to 17s.; steam coal, 14s. to 15s.; second house coal, 13s. to 15s.; engine slack, 7s. 6d. to 8s. 4d. per ton.

THE NORTHERN COAL TRADE.

(from our own correspondent.)

The northern coal trade has continued in a very depressed state during the past fortnight. Second-class coals especially have fallen very much in price, and the collieries have large stocks of this commodity on hand. Best coals maintain a very fair price in the market, but most of the pits in the northern district are working short time. Coke is lower also. There is not much difference in the rate of freights. If anything, coasting rates have been somewhat firmer. But in other respects there is an abundance of tonnage at command at moderate rates. The iron trade of this district has been considerably affected during these last eight days by the disturbed state of the Glasgow market, and the failure of two large houses in that city. The price of iron here is much lower. Middle men who have been holding coals and iron for the rise are likely to be great losers by the change that has taken place in the market. There is great excitement in the north at present over the wages question. Both the miners and ironworkers resist the proposed reductions, but no definite course has been taken yet, and it is quite likely the matters in dispute will go to arbitration. There is every appearance that before the spring is much further advanced there will have to be a general fall of all classes of wages in this district, as trade is becoming very dull. The value of coke is very much reduced here, and it is every way probable it will become lower.

Lifting a Bridge.—The town bridge at Winsford, Cheshire, which had sunk between three feet and four feet since it was raised about two and a half years ago, has been raised again to its original height by the River Weaver Trustees. This was accomplished by means of two patent hydraulic jacks, supplied by Messrs. Tangye Brothers and Holman, of London, which were placed upon timber beams, from which also the bridge was from time to time blocked up. The beams were supported upon timber piling, driven close to the four corners of the bridge. The weight of the bridge, together with the temporary timber approaches and extra road materials required to be placed upon it, would be about 200 tons. The masonry of the abutments, which was cracked, is now to be taken down and rebuilt, and the abutments and road approaches have to be raised to correspond with the altered level of the bridge. The operation was performed without any sensible interruption of the road traffic.

APPLICATIONS FOR LETTERS PATENT.

1015.—Kilpatrick, J., Barrhead, N.B., "Improved constructions of gaseliers and reflectors, which latter are also applicable to other lights and gas-jets." March 24, 1874.

1017.—Atkinson, J., Islington, Middlesex, "Improvements in the means of or apparatus for stopping and regulating the flow of air, gases, or liquids through elastic pipes." March 24, 1874.

1027.—Pout, P. G., Balham, Surrey, "Improvements in apparatus for regulating and measuring the flow and discharge of water or other liquids for preventing waste, applicable to water-closets and other purposes." March 24, 1874.

1041.—Ledingham, A. W., Aberdeen, "Improvements in cleaning gas-retorts, and in apparatus therefor." March 25, 1874.

1043.—Colebrook, C. T., Islington, Middlesex, "Improvements in pump-valves." March 25, 1874.

1052.—Jensen, P., Chancery Lane, London, "Improvements in the manufacture of gas." A communication. March 25, 1874.

1055.—Nield, T. A., Dukinfield, "Improvements in taps or valves adapted for use in controlling the flow or discharge of fluids." March 26, 1874.

1065.—Peacock, J. C., Finsbury Park Road, London, "Improvements in apparatus for heating, lighting, ventilating, and cooking." March 27, 1874.

1066.—Keith, J., Arbroath, N.B., "Improvements in the manufacture of illuminating gas, and in the apparatus employed therefor." March 27, 1874.

1069.—Beauregard, F. A. T. de, Paris, "Improvements in the packing of stuffing-boxes and pipe-joints." March 27, 1874.

1072.—Jensen, P., Chancery Lane, London, "Improvements in modes of and means for producing and utilizing gas and heat." A communication. March 27, 1874.

1079.—Nuttall, F. D., St. Helen's, Lancs, "Improvements applicable to gas-furnaces." March 28, 1874.

WANTED, a re-engagement as Manager of a medium-sized Gas-Work. Excellent references as to character for careful and successful management, &c. Accustomed to accounts and collecting.
Address Photo, care of Mr. King, 11, Bolt Court, Fleet Street, E.C.

ADVANTAGES OF GAS FOR COOKING AND HEATING,
BY
MAGNUS OHREN, A.I.C.E., F.C.S.
For Companies to issue to their gas consumers.
Specimen Copy by post 4d., direct from Magnus Ohren, Gas-Works Lower Sydenham, London, S.E.

VINCENT'S
PATENT IMPROVEMENTS
IN
Apparatus for Manufacturing Gas.
Particulars to be obtained by application to—
Mr. LAYARD JONES,
Engineer,
25, OLD BROAD STREET, LONDON, E.C.

WANTED to purchase, 5000 to 10,000 tons of GAS COKE. Waggons can be sent to any station for any proportion of above.
Address G. J. Eveson, Gas Coal and Coke Merchant, Stourbridge.

WANTED, a situation as Assistant Gas ENGINEER or SUPERINTENDENT of a Gas-Work. Thoroughly conversant with the whole working of a Gas-Work. Is a fair draughtsman, and competent to test and analyze gas. Unexceptionable references produced.
Address Engineer, care of Mr. King, 11, Bolt Court, Fleet Street, E.C.

ROBUS, SIMPSON, & ROBUS,
(Late of the Crystal Palace District Gas-Works, Sydenham, and the New City Gas-Works, Montreal, Canada,)
GENERAL CONTRACTORS & RETORT-SETTERS, FITTERS & MAIN-LAYERS.
RETORTS SET ON THE LATEST IMPROVED PLAN.
Retort-Setters sent to all parts of Europe and America.
Address, J. and H. ROBUS,
BELL GREEN, CATFORD, KENT.

WANTED, a Man qualified to lay services and connect meters.
Application, with references, stating wages required, to be made to the Manager, Gas-Works, Gloucester, on or before the 14th inst.

WANTED, by the Advertiser, aged 31, a situation as WORKING MANAGER or FOREMAN of a Gas-Work. Thoroughly understands the manufacture of gas, &c., main-laying, and fitting in all its branches, both gas and water. Is at present managing Gas and Water Works. Leaving through alteration of Company. In present situation five years. Good testimonials.
Address J. S., care of Mr. King, 11, Bolt Court, Fleet Street, E.C.

SAO PEDRO (BRAZIL) GAS COMPANY, LIMITED.
TWO additional Foremen are required to proceed at once to Brazil. They must thoroughly understand the manufacture and distribution of gas, and be capable of keeping carbonizing accounts.
Applications, with testimonials, and stating full particulars of previous experience, also age, whether married or single, and salary required, to be sent immediately to the Offices of the Company, 60, Gracechurch Street.
By order,
March 31, 1874. E. P. Rowsell, Secretary.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION has been AWARDED to

GWYNNE & BEALE'S PATENT IMPROVED GAS-EXHAUSTERS,

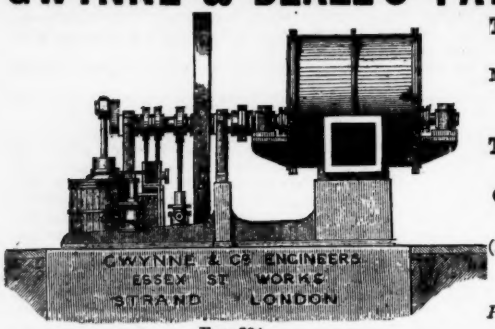


FIG. 224.

The BEST EXHAUSTERS IN THE WORLD.

Made under the personal superintendence of

Mr. BEALE,

The oldest Maker, Inventor and Patentee of

GAS-EXHAUSTING MACHINERY.

(It is NOT CORRECT to state that Mr. BEALE has RETIRED.)

Prices and every information on application.

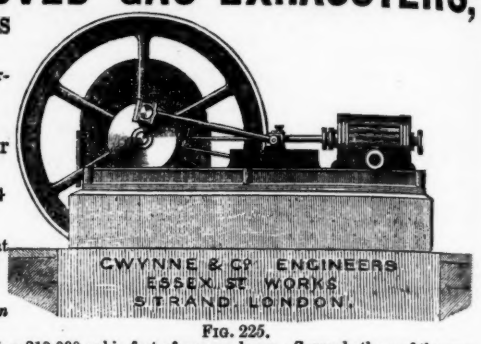


FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND Co. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 300 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES,

CAN BE HAD ON APPLICATION TO

GWYNNE & CO., HYDRAULIC & GAS ENGINEERS, ESSEX STREET WORKS, STRAND, LONDON, W.C.

G. & Co. are now manufacturing for a London Gas Company three of their 210,000 *cubic feet Patent Gas Exhausters, and many of all sizes.*

WANTED, by a thoroughly practical Engineer, late of the City of London Gas-Works, an engagement as FOREMAN or otherwise. He is well up in the general routine of gas manufacture.

Address A. S., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by the Advertiser, aged 32, an engagement as MANAGER or MANAGER and SECRETARY of a Gas-Work. Has been 15 years connected with Gas-Works. Understands perfectly the manufacture and distribution of gas in all its branches. Can procure first-class testimonials as to ability, &c.

Address B. Z., care of Mr. William Sugg, Vincent Works, Vincent Street, WESTMINSTER.

VENTNOR GAS AND WATER COMPANY.

WANTED, an Officer to undertake the duties of CLERK and COLLECTOR.

Applications, stating qualifications and salary required, to be addressed to the Secretary, on or before the 17th day of April inst. By order,

JOHN G. LIVESAY, Secretary.

Ventnor Gas and Water Company, Ventnor, April 4, 1874.

WANTED, an engagement as SUPER-INTENDENT over erection of Gas-Works, manufactory of same, Traveller, Inspector, Assistant-Engineer, or Manager. Practically experienced in all stages of manufacture and distribution of gas, manufacture of apparatus, fittings, and brass work. Aged 24.

Carte, on application to METER, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by the Bahia Gas Company, Limited, a competent ENGINEER for their works at Bahia, to act under the orders of a Commercial Manager. He must have a thorough knowledge of the manufacture and distribution of gas, particularly the setting of retorts, and the general routine of Gas-Works. Security required to the extent of £500. Terms £600 per annum, with unfurnished house, gas, and coke.

Address, with testimonials (copies only), and references, stating age, number of family if married, and in what time the applicant can proceed to Bahia, to the SECRETARY, Bahia Gas Company, Limited, 10, Coleman Street, LONDON, on or before the 15th inst.

TO SHIPPERS OF GAS COAL.

FOR SALE—Gas Coal of the very "Highest Quality."

Apply at COATS IRON-WORKS, COATBRIDGE, N.B.

SLIDE-VALVES.

FOR SALE—14 12-in. and 5 10-in. Slide-VALVES with outside racks. They have been thoroughly re-fitted, and are equal to new. A low price will be accepted to effect a clearance.

Apply to JAMES WATSON, Engineer and Manager, Crystal Palace District Gas Company, LOWER SYDENHAM, S.E.

FOR SALE, and ready for immediate delivery by the Barnstaple Gas Company, about 35 ft. of 12-in. Hydraulic Main, in five lengths; 15 ft. of 16-in. Hydraulic Main; cast-iron Stools for ditto; 21 15-in. Mouthpieces; a number of Ascension-Pipes, Bridges, and Dips; together with a quantity of odd castings suitable for a small work.

Feb. 26, 1874.

ROBERTSBRIDGE GAS COMPANY, LIMITED.

MESSRS. THOMAS & SON have been instructed by the Liquidators of the above Company to offer FOR SALE BY PUBLIC AUCTION, at the "George" Hotel, Robertsbridge, on THURSDAY, the 23rd of April, 1874, at Three for Four o'clock in the afternoon, in One Lot, subject to such conditions as shall then be produced, the recently constructed and complete GAS-WORKS, with the buildings, fixed and moveable plant, machinery, mains, pipes and lamps, and about 1 r. 31 p. of land upon which the gasometer and buildings are erected.

May be viewed, and further particulars had, by applying to Mr. SHEPPARD, Solicitor, BATTLE; or the AUCTIONEERS, BEXHILL (postal address, Sidley, Battle).

CORPORATION GAS-WORKS, BARROW-IN-FURNESS.

FOR SALE—A set of Four Dry Lime PURIFIERS, 8 ft. square, four layers (wood sieves) in each, galvanized iron covers, hydraulic centre-valve, with 9-in. connexions, and lifting crane complete.

Also TWO CAST-IRON SCRUBBERS, 18 ft. high by 4 ft. diameter, top platform, with wrought-iron railings, wrought-iron ladder, 9-in. connexions, including four Donkin's valves complete.

The above are in good working order, and are only disposed of in consequence of enlargement of works.

An inspection of the above plant, and offers to purchase, will be duly considered.

JOHN LEWIS, Manager.

Feb. 5, 1874.

SURPLUS PLANT FOR SALE.

TWO New Purifier Covers, 5 ft. 2 in. square, 15 in. deep—by Porter and Co., Lincoln.

1 new Rack Valve, 8 in.

1 Rack Valve, 6 in. 1 Screw Valve, 6 in. Both three years in use.

1 Cast-Iron Cistern, 12 by 12 by 15, with 3-in. sockets.
1 Cast-Iron Cistern, 18 by 18 by 18, with 2-in. sockets.
2 Cast-Iron Cisterns, 12 by 12 by 15, with 2-in. sockets.
1 Connexion for Scrubber, with Flange, 17 in.
2 Tees, 6 in. by 5 in., flange and socket; 1 Tee, 6 in. by 6 in.; 1 Tee, 7 in. by 5 in.; 1 Tee, 7 in. by 2 in.
5 Bends, 6 in.; 1 Flange Bend, 6 in.; 3 Bends, 5 in.; 2 Bends, 4 in.; 1 Syphon complete, 5 in.; 2 Syphons complete 2 in.; 2 Double Sockets, 6 in.; 2 Double Sockets, 7 in.; 1 Double Socket, 9 in.
8 Wrought Tramway Rails, 12 ft. each.

Apply to Mr. T. H. BOUTTELL, Manager, Gas-Works, SLEAFORD.

STATION-METER.

THE Directors of the Warrington Gas Company have for sale a STATION-METER by West and Gregson, capable of passing 20,000 cubic feet per hour. Complete with clock, tell-tale, water-gauge and regulator, valves, bye-pass, and connexions. Discontinued in consequence of being too small.

Apply to JAMES PATERSON, Engineer.

Warrington, Feb. 9, 1874.

TO IRONFOUNDERS AND OTHERS.

THE Gas Committee of the Bury Im-provement Commissioners are prepared to receive TENDERS for Four 14-feet PURIFIERS, with centre-valve complete.

Drawings and specifications may be seen at the Gas-Works, Bury, on and after Thursday, the 9th inst.

Tenders, addressed to the Gas Committee, endorsed "Tender for Purifiers," to be sent in on or before Monday, the 20th of April inst.

JOSEPH WOOD, Engineer and Manager.

Gas-Works, Bury, Lancashire, April 2, 1874.

TORQUAY GAS COMPANY.

THE Directors of the above Company are prepared to receive TENDERS for the construction and erection of a new TANK and GASHOLDER at their works, Preston, in the parish of Paignton.

The plans, specifications, and form of contract may be seen, and further particulars obtained from Mr. James Greenfield, at the works as above, and tenders stating the price for the tank and the gasholder, separately or together, are to be sent to the undersigned on or before the 15th of April next. By order,

J. KITSON, Secretary.

1, Vaughan Parade, Torquay, March 30, 1874.

SOCIETY of ARTS.—Cantor Lectures.— A course of Seven Lectures, by Professor Barff, M.A., "On Carbon and certain Compounds of Carbon, treated in reference to Heating and Illuminating," will be given at Eight o'clock on consecutive Monday evenings, commencing on April 13.

Tickets, admitting to the course, can be obtained from the Secretary, price One Guinea.—By order,

P. LE NEVE FOSTER, Secretary.

Society's House, John Street, Adelphi, London, W.C.

TAR AND AMMONIACAL LIQUOR.

THE Directors of the Shrewsbury Gas Company are open to receive TENDERS for the AMMONIACAL LIQUOR and surplus TAR produced at their works, Castle Foregate, Shrewsbury, for One or Three years, commencing on the 1st of June next.

Separate tenders under seal for the Tar and the Ammoniacal Liquor per ton, the latter advancing per degree of increased strength beyond 4° Twaddle, will be received at the Office up to the 5th day of May next.

The Directors do not bind themselves to accept the highest or any tender. By order,

S. B. DARWIN, Secretary.

Shrewsbury, March 9, 1874.

TO GAS ENGINEERS AND MANAGERS.

THE Subscriber has been authorized to DISPOSE of the following APPARATUS, all in first-rate condition:—

1 "Beale's" Exhauster, with 12-in. valves and connexions.
1 "Parkinson's" Governor, with 15-in. bye-pass valves.
1 "Milne's" Station-Meter, 10,000 cubic feet per hour.
1 "Cockey's" Change-Valve, 15-in. connexions.
2 Condensers, 30 ft. long, 18 ft. high, 2 ft. wide, with valves.
1 Steam-Pump, valuable for thick tar, &c.
1 Set of Tar and Liquor Pumps.
Also smaller Apparatus of various kinds.

Inquiries with a view to purchase will oblige D. M. NELSON, Contracting Engineer, Glasgow.

135, Buchanan Street, April 4, 1874.

TO COAL MERCHANTS, SHIPOWNERS, & OTHERS

THE Directors of the Torquay Gas Company are prepared to receive TENDERS for the supply of about 4000 to 5000 tons (or such other quantities as may be agreed on) of good and approved GAS COALS, about 600 tons per month, to be delivered during June, July, August, September, and October, and the remainder at the rate of about 400 tons per month until the contract is completed.

The Company to have the option from time to time of taking either of the Coals specified in the contract, and also of having the same delivered at Torquay, Paignton, or Dartmouth.

Tenders to state the price of the Coals and freight separately and together, and also delivery into the gas-works free of all charges.

Payment by cash for freight on delivery, and by three months bills for the Coals.

Further particulars to be obtained from Mr. Greenfield, the Manager of the Company, at the Works, Preston, Paignton; and tenders to be sent to the undersigned on or before the 15th day of April next.

By order, J. KITSON, Secretary.

Torquay, March 30, 1874.

THE GAS-FITTER'S GUIDE.—Contain-ing the principles and practice of lighting Public and Private Buildings, Theatres, and Street-Lamps, with numerous suggestions for improvements. 30 stamps, post free.

J. ELDRIDGE, 54, Murray Street, HOXTON.

PATENT FUEL AND LIME FOR PURIFYING FROM FOUL LIME.

By a simple process the Foul Lime is converted into Fuel, by the combustion of which the lime is reproduced as a purifying agent.

Licences to work the invention will be granted to Gas Companies on very reasonable terms.

For further particulars apply to Mr. E. MADDOCKS, Manager of the Gas-Works, KETTERING.

The adoption of the above invention, without a licence from the Patentee, will be an infringement of the patent, and will subject the person or company guilty of such infringement to legal process.

RICHARD THOMAS & CO.,

40, GRACECHURCH STREET,

Manufacturers of

EWELL FIRE-BRICKS, CLAY, AND CEMENT.

Warranted the best quality.

WORKS AT EPSOM.

HOW TO MAKE MONEY by PATENTS.
By Charles Barlow.
Third Edition, Enlarged, 142 pages, 8vo., Illustrated Cover.
Contents:
Hints and Suggestions as to Procuring Patents—Value of Patents—Selling Patents—Granting Licenses—Assignments—Sale to Limited Liability Companies—Value of Foreign Patents—Suggestions for the Amendment of the Law of Patents—Verbatim Copy of Letters Patent from the Crown—The Act (in full) Relative to Fraudulent Marking of Merchandise, and Use of the words "Patent" and "Registered"—Synopsis of Patent Laws of Great Britain, and of the Principal Foreign States, America, &c.
Free by post 14 stamps.
Barlow and Co., 23, Southampton Buildings, Chancery Lane, London, W.C.

PHŒNIX GASLIGHT AND COKE COMPANY.
NOTICE is hereby given that the ADJOURNED HALF-YEARLY GENERAL MEETING of PROPRIETORS holding, previous to the 31st of December last, £300 paid-up capital and upwards in the said Company, will be held, pursuant to the Act of Incorporation, on WEDNESDAY, the 8th of April, at One o'clock precisely, at the Bridge House Hotel, in the Borough of Southwark, for the purpose of declaring Dividends to the 30th of December last, to elect Directors and Auditors for the ensuing year, and on other business.
The Transfer Books will be closed on and after the 25th inst., and opened on the 9th proximo.
By order of the Court of Directors,
Isaac Adolphus Crookenden, Secretary.
70, Bankside, London, S.E., March 6, 1874.

HYDRAULIC MAIN, MOUTHPIECES, ARCH-PIP AND ASCENSION-PIPES FOR SALE.
THREE lengths Hydraulic Main, 7 ft 6 in. long, 12 in. by 15 in., with 3 4-in dips in each—D shape.
1 length Hydraulic Main, 7 ft. long, 12 in. by 12 in., with 5 dips—D shape.
2 lengths Hydraulic Main, 8 ft. 6 in. long, with 6 dips in each, 12 in. by 12 in.—D shape.
24 4-in. Retort Arch-Pipes.
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14 Retort Mouthpieces, 14-in. by 14-in—D shape.
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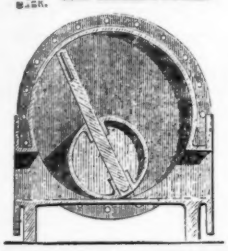
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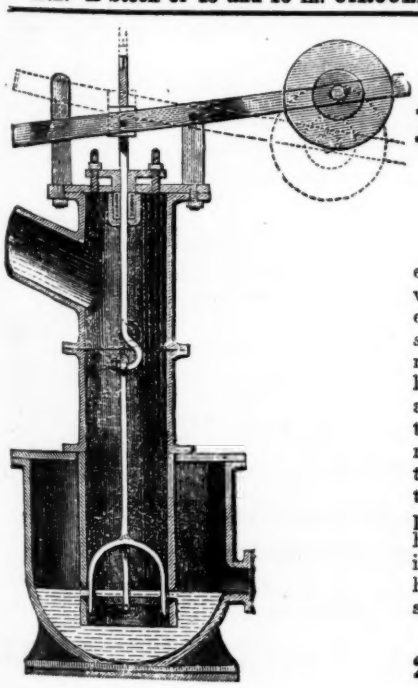
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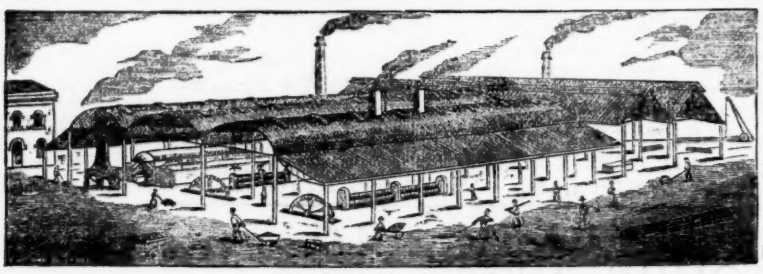

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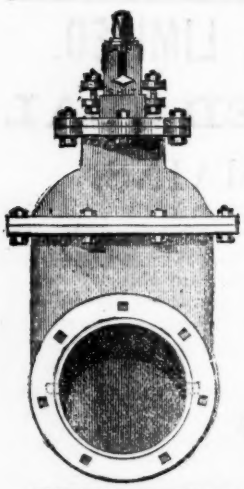

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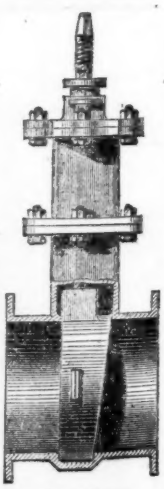

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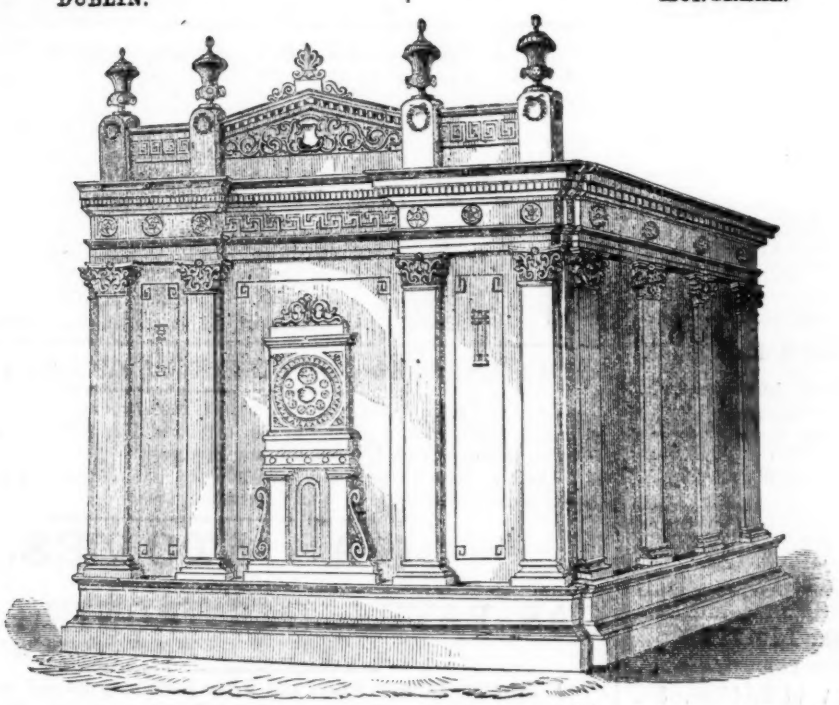

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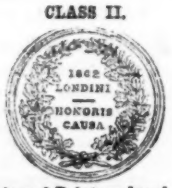

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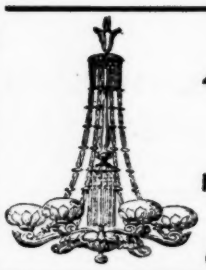

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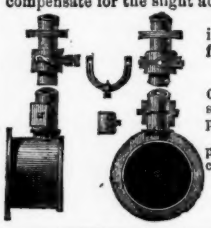

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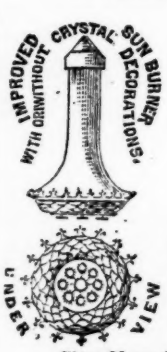

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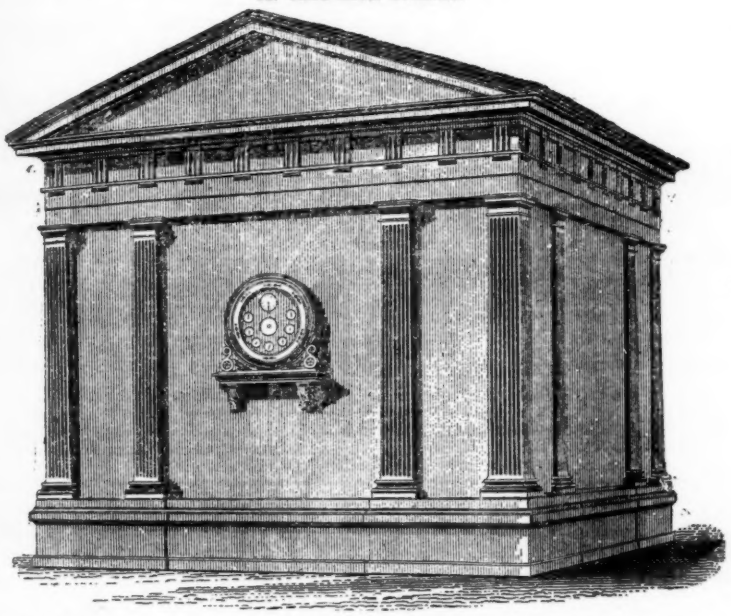

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Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.

FRANCIS RITCHIE & SONS,

BELFAST.

INTERNATIONAL EXHIBITION, 1862.

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For excellence of Fire-Clay Gas Retorts, and "HONOURABLE MENTION" for good quality of Fire-Bricks.

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SCOTSWOOD FIRE-BRICK WORKS, NEAR

BLAYDON-ON-TYNE.

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WILLINGTON QUAY,

NEAR NEWCASTLE-UPON-TYNE,

Manufacturer of

CLAY RETORTS, FIRE-BRICKS, AND EVERY DESCRIPTION OF FIRE-CLAY GOODS

B. CARPENTER,

THE ORIGINAL MANUFACTURER OF

WOOD SIEVES

FOR

GAS PURIFIERS & SCRUBBERS.

WORKS:

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TO GAS COMPANIES, ENGINEERS, &c.

WOOD SIEVES.—WOOD SIEVES.

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These Sieves are made with parallel or bevel bar, and guaranteed to be well seasoned yellow deal, and not common spruce so generally used.

N.B.—Specimens sent free on application.

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GAS APPARATUS,

PIPES, VALVES, IRON ROOFS,

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Is now in use in Moorgate Street, Cheapside, and Trafalgar Square, and has been in successful operation upon Waterloo Bridge since Oct. 7, 1871.

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CLAYTON'S PATENT SIX-WAY VALVE only requires one valve to work two purifiers; saves more than three-fourths of the connexion-pipes; requires neither tees, elbows, nor bends; no racks or springs to get out of order.
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AND
WENLOCK IRON WHARF, 20 & 22, WHARF ROAD
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Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including Iron Retorts, Socket and Flange Pipes, Bends, Branches, and Syphons of all sizes, Lamp Columns, &c., &c.
N.B.—Orders for Cast-Iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention. CHARLES HORSLEY, Agent.

HOPKINS, GILKES, & CO.,
LIMITED,
MIDDLESBOROUGH,
SUPPLY GAS & WATER PIPES of EVERY SIZE.
Plain, Turned and Bored, and Coated.
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Castings for Gas-Works of every description.
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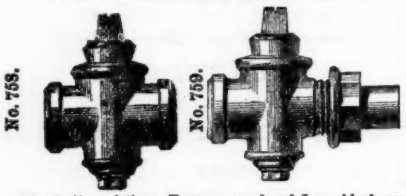
CAST-IRON GAS AND WATER PIPES AND FURNISHINGS.
MALLEABLE IRON TUBE FOR GAS, WATER, AND STEAM.
AGENTS FOR THOMAS GLOVER & CO.'S
PATENT DRY GAS-METERS.
DELIVERY F.O.B. ON CLYDE.
Lists on application.

LAMBERT'S
CAST-IRON GAS-MAIN COCKS,
WITH PATENT WHITE METAL PLUGS.


The bodies of these Taps are made of Iron, black or galvanized, and the Plugs of Patent Metal. They are warranted not to set fast or corrode as do iron or brass Cocks, will always work easily, are strong, well made, durable, of little or no intrinsic value, and, therefore, not likely to be stolen; and the PRICES are (especially upon the larger sizes) FULLY 50 PER CENT. LESS THAN BRASS COCKS.
GAS-JOINTS, CHANDELIERS, PENDANTS, BRACKETS, ETC.;
WROUGHT-IRON WELDED TUBE AND FITTINGS,
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Successors to
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OMOA GAS COAL.
THE OMOA AND CLELAND IRON AND COAL COMPANY, LIMITED,
ARE NOW IN A POSITION TO
SUPPLY FROM THEIR PITS AT OMOA
GAS COAL
OF A VERY SUPERIOR QUALITY.
This Coal, according to the report of the analyst, yields 11,110 cubic feet of gas per ton, and has an illuminating power of 33·97 candles per 5 cubic feet per hour.
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GAS ENGINEER AND CONTRACTOR FOR THE ERECTION OF GAS-WORKS,
AND FOR THE
SUPPLY OF RETORTS, FIRE-BRICKS, CAST-IRON MAINS,
AND ALL MATERIALS FOR GAS MANUFACTURE AND DISTRIBUTION.

ESTABLISHED 1844.
WHITLEY PARTNERS, LIMITED,
RAILWAY WORKS, LEEDS,
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MANUFACTURERS OF IMPROVED STEAM-ENGINES, BOILERS, PUMPS, &c.;
MAKERS, BY SPECIAL MACHINERY, OF PATENTED MECHANICAL INVENTIONS,
Comprising numerous Labour-saving Appliances and Economizers of Fuel and Motive Power;
CONTRACTORS TO THE EUROPEAN & COLONIAL GOVERNMENTS & CORPORATIONS;
MERCHANTS AND SHIPPERS OF MACHINERY, METALS, AND HARDWARE;
AWARDED
THE FIRST PRIZE MEDAL AT THE EXPOSITION UNIVERSELLE, PARIS, 1867,
"For Improved Construction, Excellence of Material, and Superior Workmanship;"
TWO GRAND GOLD MEDALS AT THE MOSCOW INTERNATIONAL EXHIBITION, 1872;
ALSO THE FIRST PRIZE MEDALS AT LEEDS AND LYONS IN 1858, 1868, and 1872.
"REDUCTION IN PRICES OF PEET'S VALVES, consequent upon largely increased sales."
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Correspondence conducted in English, German, or French.
Samples of Specialties may be inspected at Stand No. 542, Group XIII., in the English Machinery Annexe of the Vienna Exhibition, 1873. For List of same see German Official and "British Section" Catalogues.

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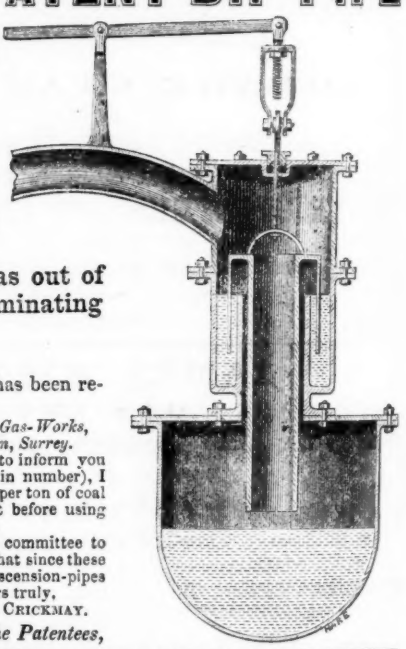
The advantages are—
1st, There is no pressure on the Retorts.
2nd, No deposit of Carbon.
3rd, No scurfing required.
4th, Never a choked Ascension Pipe.
5th, Saves Fuel and Wear and Tear.
6th, Gets 10 per cent. more Gas out of the Coal, and a higher Illuminating Power.
7th, Is never out of order.

The following (among other letters) has been received:—
Engineer's Office, Metropolitan District Asylum Gas-Works,
Messrs. Chandler and Sons. *Caterham, Surrey.*
Dear Sirs,—In reply to your inquiries, I beg to inform you that since I have used your Patented Dips (ten in number), I find my make has increased over 1000 cubic feet per ton of coal carbonized, my usual make being 9070 cubic feet before using your Dips, and 10,150 cubic feet since using them.
I should add that I intend recommending the committee to adopt them throughout these works. I also find that since these Dip-Pipes have been fitted, I have had no ascension-pipes choked, which was before a great nuisance.—Yours truly,
Jan. 15, 1874. WM. CRICKMAY.
For terms of use and cost, apply only to the Patentees,
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GAS COAL MERCHANTS,
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ALL CLASSES OF
ENGLISH, SCOTCH, & WELSH CANNEL COALS.

SCOTCH CANNEL COALS.

The Subscriber is prepared to contract for the supply of all the principal SCOTCH CANNEL COALS. Prices and Analyses of the various Coals will be forwarded on application.

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Established 1840.

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WIGAN COAL AND CANNEL,
From the Mines of the
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CANNEL COAL.
COPPA COLLIERY, MOLD,
Beg leave to call the attention of Gas Companies to the superior quality of their
CANNEL FOR GAS-MAKING PURPOSES.
This Cannel produces in actual working, in iron retorts, 9200 cubic feet of 32-candle gas, and upwards of 11 cwt. of coke, and in clay retorts will produce 11,500 cubic feet of 25·9-candle gas.
Ports of shipment—Birkenhead or Connah's Quay.
Waggons supplied for delivery by railway to any part of England or Wales.
For particulars, prices, and rates of freight, apply to The Coppa Colliery, Mold, FLINTSHIRE.

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SUPPLIED BY
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COAL and CANNEL
MERCHANTS,
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Prices Quoted on application.

THE
HUCKNALL COLLIERY COMPANY
Can offer a CANNEL COAL yielding a large quantity of Gas of superior quality.
Prices and information on application to the HUCKNALL COLLIERY COMPANY, Hucknall Torkard Collieries, near NOTTINGHAM.

POPE & PEARSON'S GAS COAL.—We have now the authority of several of the most eminent Gas Engineers of London in stating that our Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.
One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.
For further particulars, apply to POPE AND PEARSON, West Riding and Silkstone Collieries, near LEEDS.

THE MIDLAND COAL COMPANY
Are prepared to enter into CONTRACTS with
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FOR SUPPLIES OF
GAS COAL & CANNEL.
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MUIRKIRK, No. 1, CANNEL
Yields 11,600 cubic feet of 34·3-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.

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Yields 10,700 cubic feet of 32·77-candle gas per ton, and 9½ cwts. of coke, containing 11 per cent. of ash.

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Yields 12,550 cubic feet of 33-candle gas per ton.
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Delivery per Rail to any Part.

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THE DERBYSHIRE
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CAN OFFER A
GAS COAL
Of superior quality, delivered at any station in England and Wales.

Purified gas per ton of coal in cubic feet (average)	10,775
Weight of coke in lbs. per ton of coal	1,465

ANALYSIS AND PRICES ON APPLICATION TO
Mr. EDMUND TAYLOR, Secretary,
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THE UNVARYING WATER-LINE GAS-METERS,

IMPROVED DRY GAS-METERS, in Cast-Iron or Tin-Plate Cases;

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